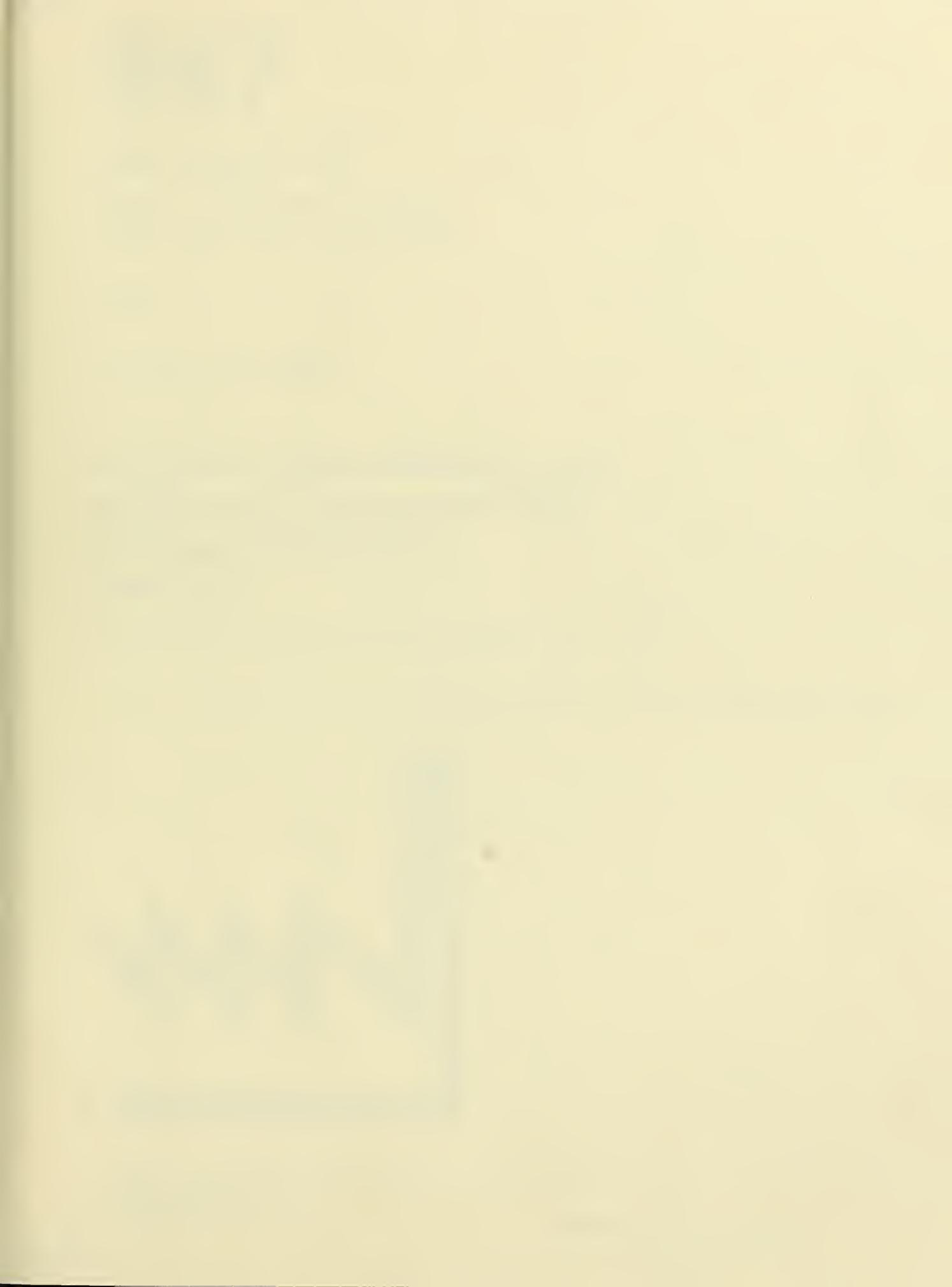


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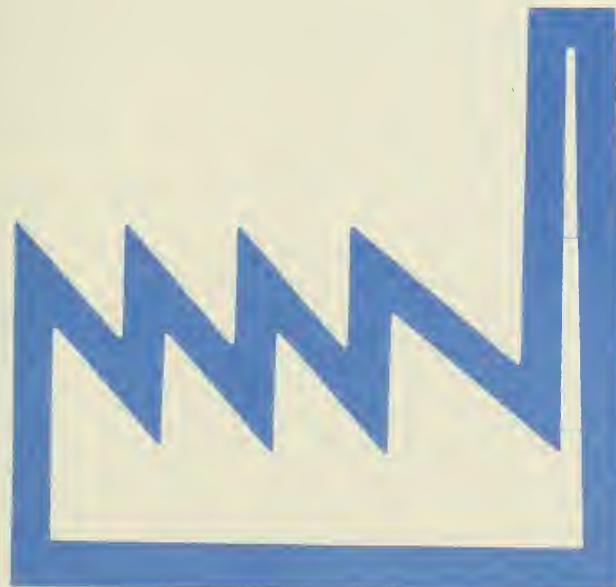
Census of Manufactures

MC87-I-36E

INDUSTRY SERIES

Electronic Components

Industries 3671, 3672, 3674, 3675, 3676,
3677, 3678, and 3679



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If you have any questions concerning the statistics in this report, call (301) 763-7304.

1987

Census of Manufactures

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INTRODUCTION

PURPOSE AND USES OF THE ECONOMIC CENSUSES

The economic censuses are the major source of facts about the structure and functioning of the Nation's economy. They provide essential information for government, business, industry, and the general public.

Economic censuses furnish an important part of the framework for such composite measures as the gross national product, input-output measures, production and price indexes, and other statistical series that measure short-term changes in economic conditions.

Policy-making agencies of the Federal Government use the data, especially in monitoring economic activity and providing assistance to business.

State and local governments use the data to assess business activities and tax bases within their jurisdictions and to develop programs to attract business.

Trade associations study trends in their own and competing industries, and keep their members informed of market changes.

Individual businesses use the data to locate potential markets and to analyze their own production and sales performance relative to industry or area averages.

AUTHORITY AND SCOPE

Title 13 of the United States Code (sections 131, 191, and 224) directs the Census Bureau to take the economic censuses every 5 years, covering years ending in 2 and 7. The 1987 Economic Censuses consist of the

- Census of Retail Trade
- Census of Wholesale Trade
- Census of Service Industries
- Census of Transportation
- Census of Manufactures
- Census of Mineral Industries
- Census of Construction Industries

Special programs also cover enterprise statistics and minority-owned and women-owned businesses. (The 1987 Census of Agriculture and 1987 Census of Governments are conducted separately.) The next economic censuses are scheduled to be taken in 1993 covering the year 1992.

AVAILABILITY OF THE DATA

The results of each of the economic censuses are available in printed reports, for sale by the U.S. Government Printing Office, and on microfiche, computer tape, compact discs with read-only memory, and flexible diskettes, for sale by the Census Bureau. Order forms for all types of products are available on request from Customer Services, Census Bureau, Washington, DC 20233. A more complete description of publications being issued from this census is on the inside back cover of this document.

Census facts are also widely disseminated by trade associations, business journals, and newspapers. Volumes containing census statistics are available in most major public and college libraries. Finally, State Data Centers in every State and Business and Industry Data Centers in many States also supply economic census statistics.

WHAT'S NEW IN 1987

Several changes have taken place for the 1987 censuses. Data will be reported on the basis of the newly revised Standard Industrial Classification (SIC) system with selected reports including "bridge tables," linking the old and new classification systems. A new set of metropolitan areas has been adopted, and more detailed information will be available for businesses with no paid employees. For additional information on these changes, review the subsequent text.

HISTORICAL INFORMATION

The economic censuses have been taken together as an integrated program at 5-year intervals since 1967, and before that for 1963, 1958, and 1954. Prior to that time, the individual censuses were taken separately at varying intervals.

The economic censuses trace their beginnings to the 1810 Decennial Census, when questions on manufacturing were included with those for population. Coverage of economic activities was expanded for 1840 and subsequent censuses to include mining and some commercial

activities. In 1902, Congress established a permanent Census Bureau and directed that a census of manufactures be taken every 5 years. The 1905 manufactures census was the first time a census was taken apart from the regular every-10-year population census.

The first census of business was taken in 1930, covering 1929. Initially it covered retail and wholesale trade, and construction industries, but it was broadened in 1933 to include some of the service trades.

The 1954 economic censuses were the first to be fully integrated—providing comparable census data across economic sectors, using consistent time periods, concepts, definitions, classifications, and reporting units. These were the first censuses to be taken by mail, using lists of firms provided by the administrative records of other federal agencies. Since 1963, administrative records have also been used to provide basic statistics as well for very small firms, reducing or eliminating the need to send them census questionnaires. The Enterprise Statistics Program, which publishes combined data from the economic censuses, was made possible with the implementation of the integrated census program in 1954.

The range of industries covered in the economic censuses has continued to expand. The Census of Construction Industries began on a regular basis in 1967, and the scope of service industries was broadened in 1967, 1977, and 1987. The Census of Transportation began in 1963 as a set of surveys covering travel, transportation of commodities, and trucks. New for 1987 are publications reporting on business establishments engaged in several transportation industries, paralleling the data on establishments in other sectors. This is part of a gradual expansion in coverage of industries previously subjected to government regulation. The Survey of Minority-Owned Business Enterprises was first conducted as a special project in 1969 and was incorporated into the economic censuses in 1972 along with the Survey of Women-Owned Businesses.

Economic censuses have also been taken in Puerto Rico since 1909, in the Virgin Islands and Guam since 1958, and in the Northern Mariana Islands since 1982.

Statistical reports from the 1982 and earlier censuses provide historical figures for the study of long-term time series, and are available in some large libraries. All of the census data published since 1967 are still available for sale on microfiche from the Census Bureau.

AVAILABILITY OF MORE FREQUENT ECONOMIC DATA

While the censuses provide complete enumerations every 5 years, there are many needs for more frequent data as well. The Census Bureau conducts a number of monthly, quarterly, and annual surveys, the results of which appear in publication series such as *Current Business Reports* (retail and wholesale trade and service industries), the *Annual Survey of Manufactures*, *Current Industrial Reports*, and the *Quarterly Financial Report*. Most of these surveys, while providing more frequent

observations, yield less kind-of-business and geographic detail than the censuses. The *County Business Patterns* program offers annual statistics on the number of establishments, employment, and payroll classified by industry within each county.

SOURCES FOR MORE INFORMATION

More information about the scope, coverage, classification system, data items, and publications for each of the economic censuses and related surveys is published in the *Guide to the 1987 Economic Censuses and Related Statistics*. More information on the methodology, procedures, and history of the censuses will be published in the *History of the 1987 Economic Censuses*. Contact Customer Services for information on availability.

CENSUS OF MANUFACTURES

General

This report, from the 1987 Census of Manufactures, is one of a series of 83 industry reports, each of which provides statistics for individual industries or groups of related industries. Additional separate reports will be issued for each State and the District of Columbia and for special subjects such as type of organization, distribution of sales by class of customer, concentration ratios and water use in manufacturing.

The industry reports include such statistics as number of establishments, employment, payroll, value added by manufacture, cost of materials consumed, capital expenditures, product shipments, etc.

State reports present similar statistics for each State and its important metropolitan statistical areas (MSA's), counties, and places. Selected statistical totals for "all manufacturing" have been shown in the State reports for MSA's with 250 employees or more and for counties and places with 450 employees or more.

The *General Summary* report will contain industry, product class, and geographic area statistics summarized in one report. The introduction to the *General Summary* discusses, at greater length, many of the subjects described in this introduction. For example, the *General Summary* text will discuss the relationship of value added by manufacture to National income by industry of origin, the changes in statistical concepts over the history of the censuses, and the valuation problems arising from intracompany transfers between manufacturing plants of a company and between manufacturing plants and sales offices and sales branches of a company.

Scope of Census and Definition of Manufacturing

The 1987 Census of Manufactures covers all establishments with one paid employee or more primarily engaged in manufacturing as defined in the *1987 Standard Industrial*

*Classification (SIC) Manual*¹. This is the system of industrial classification developed by experts on classification in Government and private industry under the guidance of the Office of Information and Regulatory Affairs, Office of Management and Budget. This classification system is used by Government agencies as well as many organizations outside the Government.

The SIC Manual defines manufacturing as the mechanical or chemical transformation of substances or materials into new products. The assembly of component parts of products also is considered to be manufacturing if the resulting product is neither a structure nor other fixed improvement. These activities are usually carried on in plants, factories, or mills that characteristically use power-driven machines and materials-handling equipment.

Manufacturing production is usually carried on for the wholesale market, for transfers to other plants of the same company, or to the order of industrial users rather than for direct sale to the household consumer. Some manufacturers in a few industries sell chiefly at retail to household consumers through the mail, through house-to-house routes, or through salespersons. Some activities of a service nature (enameling, engraving, etc.) are included in manufacturing when they are performed primarily for trade. They are considered nonmanufacturing when they are performed primarily to the order of the household consumer.

Relationship Between Annual Survey of Manufactures and Census of Manufactures

The Bureau of the Census conducts the annual survey of manufactures (ASM) in each of the 4 years between the censuses of manufactures. The ASM is a probability-based sample of approximately 56,000 establishments and collects the same industry statistics (employment, payroll, value of shipments, etc.) as the census of manufactures. In addition to collecting the information normally requested on the census form, the establishments in the ASM sample are requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, costs of purchased services, and foreign content of materials consumed. Except for supplemental labor costs, the extra ASM items are collected only in census years.

Establishment Basis of Reporting

The census of manufactures is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each location. The ASM also is conducted on an establishment basis, but separate reports are filed for just those establishments selected in the sample. Companies engaged in

distinctly different lines of activity at one location are requested to submit separate reports if the plant records permit such a separation and if the activities are substantial in size.

In 1987, as in earlier years, a minimum size limit was set for inclusion of establishments in the census. All establishments employing one person or more at any time during the census year are included. The same size limitation has applied since 1947 in censuses and annual surveys of manufactures. In the 1939 and earlier censuses, establishments with less than \$5,000 value of products were excluded. The change in the minimum size limit in 1947 does not appreciably affect the historical comparability of the census figures except for data on number of establishments for a few industries. This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units that service manufacturing establishments of the same company (see Auxiliaries).

Manufacturing Universe and Census Report Forms

The 1987 Census of Manufactures universe includes approximately 350,000 establishments. The amounts of information requested from manufacturing establishments were dependent upon a number of factors. The more important considerations were the size of the company and whether it was included in the annual survey of manufactures. The methods of obtaining information for the various subsets of the universe to arrive at the aggregate figures shown in the publication are described below:

1. Small Single-Establishment Companies Not Sent a Report Form

In the 1987 Census of Manufactures, approximately 150,000 small single-establishment companies were excused from filing reports. Selection of these small establishments was done on an industry-by-industry basis and was based on annual payroll and total shipments data as well as on the industry classification codes contained in the administrative records of Federal agencies. The cutoffs were selected so that these administrative-records cases would account for no more than 3 percent of the value of shipments for all manufacturing. Generally, all single-establishment companies with less than five employees were excused, while all establishments with more than 20 employees were mailed forms.

Information on the physical location of the establishment, as well as information on payrolls, receipts (shipments), and industry classification, was obtained from the administrative records of other Federal agencies under special arrangements, which safeguarded their confidentiality. Estimates of data for these small establishments were developed using industry averages in conjunction with the administrative information. The value of shipments and cost of materials

¹Standard Industrial Classification Manual: 1987: For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, Stock No. 041-001-00314-2.

were not distributed among specific products and materials for these establishments but were included in the product and material "not specified by kind" (n.s.k.) categories.

The industry classification codes included in the administrative-records files were assigned on the basis of brief descriptions of the general activity of the establishment. As a result, an indeterminate number of establishments were erroneously coded at the four-digit SIC level. This was especially true whenever there was a relatively fine line of demarcation between industries or between manufacturing and nonmanufacturing activity.

Sometimes these administrative-record cases were only given a two- or three-digit SIC group. For the 1987 Census of Manufactures, these establishments were sent a separate classification form, which requested information on the products and services of the establishment. This form was used to code many of these establishments to the four-digit SIC level. Establishments that did not return the classification form were coded later to those four-digit SIC industries identified as "not elsewhere classified" (n.e.c.) within the given two- or three-digit industry groups.

As a result of these situations, a number of small establishments may have been misclassified by industry. However, such possible misclassification has no significant effect on the statistics other than on the number of companies and establishments.

The total establishment count for individual industries should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the count of total number of establishments.

2. Establishments Sent a Report Form

The 200,000 establishments covered in the mail canvass were divided into three groups:

a. **ASM sample establishments**—This group consisted of approximately 56,000 establishments covering all the units of large manufacturing establishments as well as a sample of the medium and smaller establishments. The probability of selection was proportionate to size (see appendix, Annual Survey of Manufactures).

In a census of manufactures year, the ASM report form (MA-1000) replaces the first page of the regular census form for those establishments included in the ASM. In addition to information on employment, payroll, and other items normally requested on the regular census form, establishments in the ASM sample were requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services. See appendix A, section 2, for an explanation of these items.

The census part of the report form is one of approximately 200 versions containing product, material, and special inquiries. The diversity of manufacturing activities necessitated the use of these many forms to canvass the 459 manufacturing industries. Each form was developed for a group of related industries.

Appearing on each form was a list of products primary to the group of related industries as well as secondary products and miscellaneous services that establishments classified in these industries were likely to be performing. Respondents were requested to identify the products, the value of each product, and, in a large number of cases, the quantity of the product shipped during the survey year. Space also was provided for the respondent to describe products not specifically identified on the form.

The report form also contained a materials-consumed inquiry, which varied from form to form depending on the industries being canvassed. The respondents were asked to review a list of materials generally used in their production processes. From this list, each establishment was requested to identify those materials consumed during the survey year, the cost of each, and, in certain cases, the quantity consumed. Once again, space was provided for the respondent to describe significant material not identified on the form.

Finally, a wide variety of special inquiries was included to measure activities peculiar to a given industry, such as operations performed and equipment used.

b. **Large and medium establishments (non-ASM)**—Approximately 84,000 establishments were included in this group. A variable cutoff, based on administrative-records payroll data and determined on an industry-by-industry basis, was used to select those establishments that were to receive one of the approximately 200 census of manufactures regular forms. The first page, requesting establishment data for items such as employment and payroll, was standard but did not contain the detailed statistics included on the ASM form. The product, material, and special inquiry sections supplied were based on the historical industry classification of the establishment.

c. **Small single-establishment companies (non-ASM)**—This group consisted of approximately 60,000 establishments. For those industries where application of the variable cutoff for administrative-records cases resulted in a large number of small establishments being included in the mail canvass, an abbreviated or "short" form was used. These establishments received one of the approximately 80 versions of the short form, which requested

summary product and material data and totals but no details on employment, payrolls, cost of materials, inventories, and capital expenditures.

Use of the short form has no adverse effect on published totals for the industry statistics; the same data were collected on the short form as on the long form. However, detailed information on materials consumed was not collected on the short form; thus its use would increase the value of the n.s.k. categories.

Auxiliaries

In this industry report, the data on employment and payroll are limited to operating manufacturing establishments. The census report form filed for auxiliaries (ES-9200) requested a description of the activity of the establishments serviced. However, the manufacturing auxiliaries were coded only to the two-digit major group of the establishments they served; whereas, the operating establishments were coded to a four-digit manufacturing industry. Data for the approximately 10,000 separately operated auxiliaries are included in the geographic area series and in a report issued as part of the 1987 Enterprise Statistics Survey.

Auxiliaries are establishments whose employees are primarily engaged in performing supporting services for other establishments of the same company, rather than for the general public or for other business firms. They can be at different locations from the establishments served or at the same location as one of those establishments but not operating as an integral part thereof and serving two establishments or more. Where auxiliary operations are conducted at the same location as the manufacturing operation and operate as an integral part thereof, they usually are included in the report for the operating manufacturing establishment.

Included in the broad category of auxiliaries are administrative offices. Employees in administrative offices are concerned with the general management of multiestablishment companies, i.e., with the general supervision and control of two units or more, such as manufacturing plants, mines, sales branches, or stores. The functions of these employees may include (1) program planning, including sales research and coordination of purchasing, production, and distribution; (2) company purchasing, including general contracts and purchasing methods; (3) company financial policy and accounting; (4) general engineering, including design of product machinery and equipment, and direction of engineering effort conducted at the individual operation locations; (5) direction of company personnel matters; and (6) legal and patent matters.

Other types of auxiliaries serving the plants or central management of the company include purchasing offices, sales promotion offices, research and development organizations, etc.

Industry Classification of Establishments

Each of the establishments covered in the census was classified in 1 of 459 manufacturing industries in accordance with the industry definitions in the 1987 SIC Manual. The 1987 edition of this manual represents a major revision for manufacturing industries from the 1972 edition and its 1977 supplement. Appendix A of the 1987 Manual notes the revisions in the four-digit industry levels between 1972/77 and 1987.

An industry is generally defined as a group of establishments producing the same product or a closely related group of products. The product groupings from which industry classifications are derived are based on considerations such as similarity of manufacturing processes, types of materials used, types of customers, and the like. The resulting group of establishments must be significant in terms of number, value added by manufacture, value of shipments, and number of employees. The system operates in such a way that the definitions progressively become narrower with successive additions of numerical digits. For 1987, there are 20 major groups (two-digit SIC), 139 industry groups (three-digit SIC), and 459 industries (four-digit SIC). This represents an expansion of four-digit industries from 452 in 1972/77 and a reduction of three-digit groups from 143 in 1972/77. Product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. There are about 11,000 products identified by a seven-digit code. The seven-digit products are considered the primary products of the industry with the same four digits.

Accordingly, an establishment is usually classified in a particular industry on the basis of its major activity during a particular year, i.e., production of the products primary to that industry exceeds, in value, production of the products primary to any other single industry. In a few instances, however, the industry classification of an establishment is not only determined by the products it makes but also by the process employed in operations. Refining of nonferrous metals from ore or rolling and drawing of nonferrous metals (processes which involve heavy capitalization in specialized equipment) would be classified according to the process used during a census year. These establishments then would be "frozen" in that industry during the following ASM years.

In either a census or ASM year, establishments included in the ASM sample with certainty weight, other than those involved with heavily capitalized activities described above, are reclassified by industry only if the change in the primary activity from the prior year is significant or the change has occurred for 2 successive years. This procedure prevents reclassification when there are minor shifts in product mix.

In ASM years, establishments included in the ASM sample with noncertainty weight are not shifted from one industry classification to another. They are retained in the industry where they were classified in the base census year (see appendix, Annual Survey of Manufactures).

However, in the following census year, these ASM plants are allowed to shift from one industry to another.

The result of these rules covering the switching of plants from one industry classification to another is that, at the aggregate level, some industries comprise different mixes of establishments between survey years, and establishment data for such industry statistics as employment and payroll may be tabulated in different industries between survey years. Hence, comparisons between prior-year and current-year published totals, particularly at the four-digit SIC level, should be viewed with caution. This is particularly true for the comparison between the data shown for a census year versus the data shown for the previous ASM year.

As previously noted, the small establishments that may have been misclassified by industry are usually administrative-record cases whose industry codes were assigned on the basis of incomplete descriptions of the general activity of the establishment. Such possible misclassifications have no significant effect on the statistics other than on the number of companies and establishments.

While some establishments produce only the primary products of the industry in which they are classified, all establishments of an industry rarely specialize to this extent. The industry statistics (employment, inventories, value added by manufacture, total value of shipments including resales and miscellaneous receipts, etc.) shown in tables 1a through 5a, therefore, reflect not only the primary activities of the establishments in that industry but also their secondary activities. The product statistics in table 6a represent the output of all establishments whether or not they are classified in the same industry as the product. For this reason, in relating the industry statistics, especially the value of shipments to the product statistics, the composition of the industry's output shown in table 5b should be considered.

The extent to which industry and product statistics may be matched with each other is measured by two ratios which are computed from the figures shown in table 5b. The first of these ratios, called the primary product specialization ratio, measures the proportion of product shipments (both primary and secondary) of the establishments classified in the industry represented by the primary products of those establishments. The second ratio, called the coverage ratio, is the proportion of primary products shipped by the establishments classified in the industry to total shipments of such products by all manufacturing establishments.

However, establishments making products falling into the same industry category may use a variety of processes and materials to produce them. Also, the same industry classification (based on end products) may include both establishments that are highly integrated and those that put only the finishing touches on an already highly fabricated item. For example, the refrigeration equipment industry includes instances of almost complete integration (production of the compressor, condensing unit, electric motor, casting, stamping of the case, and final assembly) all

carried on at one plant. On the other hand, the condensing unit, the motor, and the case may be purchased and only assembled into the finished product.

In some instances, separate industry categories have been established for integrated and nonintegrated establishments. For other industries, the census provides separate statistics on the production of intermediate commodities made and used in the producing plant. For some industries characterized by many plants of the same company, separate figures on interplant transfers of products usually are shown.

Differences in the integration of production processes, types of operations, and alternatives in types of materials used should be considered when relating the industry statistics (employment, payrolls, value added, etc.) to the product and material data.

Value of Shipments for the Industry Compared With Value of Product Shipments

This report shows value of shipments data for industries and products. In tables 1a through 5a, these data represent the total value of shipments of all establishments classified in a particular industry. The data include the shipments of the products classified in the industry (primary to the industry), products classified in other industries (secondary to the industry), and miscellaneous receipts (repair work, sale of scrap, research and development, installation receipts, and resales). Value of product shipments shown in table 6a represents the total value of all products shipped that are classified as primary to an industry.

CENSUS DISCLOSURE RULES

In accordance with Federal law governing census reports, no data are published that would disclose the data for an individual establishment or company. However, the number of establishments classified in a specific industry is not considered a disclosure, so this information may be released even though other information is withheld.

The disclosure analysis for the industry statistics in tables 1a through 5a of this report is based on the total value of shipments. When the total value of shipments cannot be shown without disclosing information for individual companies, the complete line is suppressed. However, the suppressed data are included in higher-level totals. Additional disclosure analysis is performed for new capital expenditures that can be suppressed even though value of shipments data are publishable.

SPECIAL TABULATIONS

Special tabulations of data collected in the 1987 Census of Manufactures may be obtained on computer tape or in tabular form. The data will be in summary form and subject to the same rules prohibiting disclosure of confidential

information (including name, address, kind of business, or other data for individual business establishments or companies) as are the regular publications.

Special tabulations are prepared on a cost basis. A request for a cost estimate, as well as exact specifications on the type and format of the data to be provided, should be directed to the Chief, Industry Division, Bureau of the Census, Washington, DC 20233.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in this publication:

-	Represents zero.
(D)	Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
(NA)	Not available.
(NC)	Not comparable.
(S)	Withheld because estimate did not meet publication standards.
(X)	Not applicable.
(Z)	Less than half the unit shown.
do	Ditto.

n.e.c.	Not elsewhere classified.
n.s.k.	Not specified by kind.
pt.	Part.
r	Revised.
SIC	Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and tons, are used in the customary sense.

CONTACTS FOR DATA USERS

Subject Area	Contact	Phone
Census/ASM		
Durables	Kenneth Hansen	(301) 763-7304
Nondurables	Michael Zampogna	(301) 763-2510
Current Industrial Reports		
Durables	Malcolm Bernhardt	(301) 763-2518
Nondurables	Thomas Flood	(301) 763-5911
Import/Export Publications	Foreign Trade Division	(301) 763-5140
Industry Analysis and Forecasts	International Trade Administration	(202) 377-4356

Users' Guide for Locating Statistics in This Report by Table Number

For explanation of terms, see appendixes

Item	Four-digit industry statistics							Five-digit product class and seven-digit product statistics			
	Historical	Operat-ing ratios	By geo-graphic area	Sum-mary and supple-mental	By employ-ment size	By industry and product class special-ization	Materials con-sumed by kind	Industry-product analysis	Product ship-ments	Product class by geo-graphic area	Historical product class
Number of companies	1a			3a					*6a		
Number of establishments....	1a			2	3a	4	5a				
Employment and payroll:.....											
Number of employees	1a	1b		2	3a	4	5a				
Payroll	1a	1b		2	3a	4	5a				
Supplemental labor costs ..					3a						
Production workers.....	1a	1b		2	3a	4	5a				
Production-worker hours....	1a	1b		2	3a	4	5a				
Production-worker wages...	1a	1b		2	3a	4	5a				
Shipments, cost of materials, and value added:											
Value of shipments (four-digit)	1a	1b		2	3a	4	5a		5b		
Product class shipments (five-digits)										6a	6b
Product shipments (seven-digit)										6a	6c
Value added by manufacture	1a	1b		2	3a	4	5a				
Cost of materials.....	1a	1b		2	3a	4	5a				
Fuels and electric energy ..					3a						
Materials consumed by kind					3a						
Inventories:											
Total, end of year	1a				3a						
By stage of fabrication.....					3a						
Capital expenditures, assets, rental payments, and purchased services:											
New capital expenditures....	1a			2	3b	4	5a				
Used plant and equipment expenditures.....					3b						
Gross assets					3b						
Depreciation.....					3b						
Retirements of buildings and machinery					3b						
Rental payments.....					3b						
Foreign content of materials consumed.....					3c						
Purchased services.....					3c						
Ratios:											
Specialization.....	1a				3a				5b		
Coverage.....	1a				3a				5b		

*Number of companies with shipments of more than \$100 thousand.

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DESCRIPTION OF INDUSTRIES AND SUMMARY OF FINDINGS

This report shows 1987 Census of Manufactures statistics for establishments classified in each of the following industries:

SIC code and title

3671	Electron Tubes
3672	Printed Circuit Boards
3674	Semiconductors and Related Devices
3675	Electronic Capacitors
3676	Electronic Resistors
3677	Electronic Coils and Transformers
3678	Electronic Connectors
3679	Electronic Components, N.E.C.

The industry statistics (employment, payroll, cost of materials, value of shipments, inventories, etc.) are reported for each establishment as a whole. Aggregates of such data for an industry reflect not only the primary activities of the establishments but also their activities in the manufacture of secondary products as well as their miscellaneous activities (contract work on materials owned by others, repair work, etc.). This fact should be taken into account when comparing industry statistics (tables 1 through 5a) with product statistics (table 6) showing shipments by all industries of the primary products of the specified industry. The extent of the "product mix" is indicated in table 5b, which shows the value of primary and secondary products shipped by establishments classified in the specified industry and the value of primary products of the industry shipped as secondary products by establishments classified in other industries.

Small single-establishment companies with up to 20 employees (cutoff varied by industry) were excluded from the mail portion of the census. For these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated), data on payrolls and receipts were obtained from administrative records of other Federal agencies. The remaining statistics were developed from industry averages.

Establishment data were tabulated based on industry definitions included in the 1987 Standard Industrial Classification (SIC) Manual¹. The 1987 edition represents a major revision for manufacturing industries from the 1972 edition and its 1977 supplement. In addition to the 1987

SIC revision, changes were made to the product class (five-digit) and product code (seven-digit) categories. The product class and product code comparability between the 1987 and 1982 censuses is shown in the appendixes. These appendixes present, in tabular form, the linkage from 1987 to 1982.

All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

INDUSTRY 3671, ELECTRON TUBES

This industry is made up of establishments primarily engaged in manufacturing electron tubes and tube parts. Establishments primarily engaged in manufacturing X-ray tubes and parts are classified in industry 3844. Products of this industry also are collected in the Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components.

The 1987 definition of this industry has been revised from that used in the 1972 Standard Industrial Classification (SIC) manual. However, the SIC number is unchanged. Industry 3671 now includes electron tube parts which were reclassified from 1972 SIC-based Industry 3679, Electronic Components, Not Elsewhere Classified. The effect of the revisions on the data is summarized in tables 1c-1 and 1c-2. During the 1987 processing, each establishment was classified according to both the old and new SIC. Table 1c-1 shows the distribution of the new industry among the old SIC classifications. Table 1c-2 shows the distribution of the old SIC-based industries among the new SIC classifications.

In the 1987 Census of Manufactures, Industry 3671, Electron Tubes, had employment of 28.4 thousand. The leading States in employment in 1987 were California, Pennsylvania, Illinois, and Massachusetts.

The total value of shipments for establishments classified in this industry was \$2.7 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3671 shipped \$2.2 billion of electron tubes products considered primary to the industry, \$432.9 million of secondary products, and had \$128.1 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary

¹Standard Industrial Classification Manual: 1987. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-00314-2.

products to the total of both secondary and primary products shipped by establishments in the industry was 83 percent (specialization ratio).

Establishments in this industry also accounted for 93 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). The products primary to industry 3671, no matter in what industry they were produced, appear in table 6a and aggregate to \$2.3 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the electron tubes industry amounted to \$1.2 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 4 percent of total value of shipments.

INDUSTRY 3672, PRINTED CIRCUIT BOARDS

This industry is made up of establishments primarily engaged in manufacturing printed circuit boards. Products of this industry also are collected in the Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components.

Industry 3672, Printed Circuit Boards, was previously included in the statistics for old Industry 3679, Electronic Components, N.E.C., under the 1972-based SIC. The effect of the revisions on the data is summarized in tables 1c-1 and 1c-2. During the 1987 processing, each establishment was classified according to both the old and new SIC. Table 1c-1 shows the distribution of the new industry among the old SIC classifications. Table 1c-2 shows the distribution of the old SIC-based industries among the new SIC classifications.

In the 1987 Census of Manufactures, Industry 3672, Printed Circuit Boards, had employment of 66.6 thousand. The leading States in employment in 1987 were California, Minnesota, New York, and Massachusetts.

The total value of shipments for establishments classified in this industry was \$4.7 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3672 shipped \$4.4 billion of printed circuit boards products considered primary to the industry, \$143.6 million of secondary products, and had \$115.1 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of

primary products to the total of both secondary and primary products shipped by establishments in the industry was 97 percent (specialization ratio).

Establishments in this industry also accounted for 92 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). The products primary to industry 3672, no matter in what industry they were produced, appear in table 6a and aggregate to \$4.8 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the printed circuit boards industry amounted to \$2.0 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 17 percent of total value of shipments.

INDUSTRY 3674, SEMICONDUCTORS AND RELATED DEVICES

This industry is made up of establishments primarily engaged in manufacturing semiconductors and related solid-state devices. Important products of this industry are semiconductor diodes and stacks, including rectifiers, integrated microcircuits (semiconductor networks), transistors, solar cells, and light sensing and emitting semiconductors (solid-state) devices. Products of this industry also are collected in the Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1987 Census of Manufactures, Industry 3674, Semiconductors and Related Devices, had employment of 184.6 thousand. The employment figure was 11 percent above the 166.5 thousand reported in 1982. Compared with 1986, employment increased 7 percent. The 1986 data are based on the Bureau's annual survey of manufacturers (ASM), which is a sample survey conducted each year between censuses. The leading States in employment in 1987 were California, Arizona, Texas, and New York, accounting for 62 percent of the industry's employment. These same States were the leaders in 1982, when they accounted for 67 percent of the industry's employment.

The total value of shipments for establishments classified in this industry was \$19.8 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous

receipts, such as resales and contract receipts. Industry 3674 shipped \$17.1 billion of semiconductors and related devices products considered primary to the industry, \$801.4 million of secondary products, and had \$1.9 billion of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 96 percent (specialization ratio). In 1982, the specialization ratio was 94 percent.

Establishments in this industry also accounted for 95 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 96 percent. The products primary to industry 3674, no matter in what industry they were produced, appear in table 6a and aggregate to \$17.9 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the semiconductors and related devices industry amounted to \$6.5 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 11 percent of total value of shipments.

INDUSTRY 3675, ELECTRONIC CAPACITORS

This industry is made up of establishments primarily engaged in manufacturing electronic capacitors. Establishments primarily engaged in manufacturing electrical capacitors are classified in industry 3629. Products of this industry also are collected in the Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system.

In the 1987 Census of Manufactures, Industry 3675, Electronic Capacitors, had employment of 21.7 thousand. The employment figure was 25 percent below the 28.9 thousand reported in 1982. Compared with 1986, employment decreased 2 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses. The leading States in employment in 1987 were South Carolina, California, New York, and Massachusetts, accounting for 50 percent of the industry's employment. These same States were the leaders in 1982, when they accounted for 52 percent of the industry's employment.

The total value of shipments for establishments classified in this industry was \$1.4 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3675 shipped \$1.3 billion of electronic capacitors products considered primary to the industry, \$97.9 million of secondary products, and had \$77.2 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 93 percent (specialization ratio). In 1982, the specialization ratio was 94 percent.

Establishments in this industry also accounted for 97 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 90 percent. The products primary to industry 3675, no matter in what industry they were produced, appear in table 6a and aggregate to \$1.3 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the electronic capacitors industry amounted to \$551.3 million. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 10 percent of total value of shipments.

INDUSTRY 3676, ELECTRONIC RESISTORS

This industry is made up of establishments primarily engaged in manufacturing electronic resistors. Establishments primarily engaged in manufacturing resistors for telephone and telegraph apparatus are classified in industry 3661. Products of this industry also are collected in the Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1987 Census of Manufactures, Industry 3676, Electronic Resistors, had employment of 15.7 thousand. The employment figure was 14 percent below the 18.3 thousand reported in 1982. The leading States in employment in 1987 were California, Texas, Indiana, and Nebraska. This represents a shift from 1982 when California, Nebraska, North Carolina, and New Hampshire were the leading States in employment.

The total value of shipments for establishments classified in this industry was \$882.7 million.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous

receipts, such as resales and contract receipts. Industry 3676 shipped \$809.0 million of electronic resistors products considered primary to the industry, \$46.6 million of secondary products, and had \$27.2 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 95 percent (specialization ratio). In 1982, the specialization ratio was 89 percent.

Establishments in this industry also accounted for 94 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 88 percent. The products primary to industry 3676, no matter in what industry they were produced, appear in table 6a and aggregate to \$860.2 million. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the electronic resistors industry amounted to \$281.3 million. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 10 percent of total value of shipments.

INDUSTRY 3677, ELECTRONIC COILS AND TRANSFORMERS

This industry is made up of establishments primarily engaged in manufacturing electronic coils, transformers, and inductors. Establishments primarily engaged in manufacturing electrical transformers are classified in industry 3612; those manufacturing transformers and inductors for telephone and telegraph apparatus are classified in industry 3661, and those manufacturing semiconductors and related devices are classified in industry 3674. Products of this industry also are collected in the Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1987 Census of Manufactures, Industry 3677, Electronic Coils and Transformers, had employment of 23.9 thousand. The employment figure was 1 percent above the 23.7 thousand reported in 1982. The leading States in employment in 1987 were Illinois, New York, California, and Indiana. These same States were the leaders in 1982.

The total value of shipments for establishments classified in this industry was \$1.2 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3677 shipped \$1.1 billion of electronic coils and transformers products considered primary to the industry, \$123.4 million of secondary products, and had \$27.3 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 90 percent (specialization ratio). In 1982, the specialization ratio was 91 percent.

Establishments in this industry also accounted for 91 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 84 percent. The products primary to industry 3677, no matter in what industry they were produced, appear in table 6a and aggregate to \$1.2 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the electronic coils and transformers industry amounted to \$476.1 million. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 14 percent of total value of shipments.

INDUSTRY 3678, ELECTRONIC CONNECTORS

This industry is made up of establishments primarily engaged in manufacturing electronic connectors. Establishments primarily engaged in manufacturing electrical connectors are classified in industry 3643; those manufacturing electronic capacitors are classified in industry 3675; and those manufacturing electronic coils, transformers, and other inductors are classified in industry 3677. Products of this industry also are collected in the Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1987 Census of Manufactures, Industry 3678, Electronic Connectors, had employment of 43.8 thousand. The employment figure was 10 percent above the 39.7 thousand reported in 1982. Compared with 1986, employment increased 14 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses. The leading States in employment in 1987 were

California, Pennsylvania, New York, and Connecticut, accounting for 61 percent of the industry's employment. This represents a shift from 1982 when California, New York, Pennsylvania, and Illinois accounted for 64 percent of the industry's employment.

The total value of shipments for establishments classified in this industry was \$4.1 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3678 shipped \$3.4 billion of electronic connectors products considered primary to the industry, \$522.7 million of secondary products, and had \$95.3 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 87 percent (specialization ratio). In 1982, the specialization ratio also was 87 percent.

Establishments in this industry also accounted for 92 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 91 percent. The products primary to industry 3678, no matter in what industry they were produced, appear in table 6a and aggregate to \$3.7 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the electronic connectors industry amounted to \$1.5 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 10 percent of total value of shipments.

INDUSTRY 3679, ELECTRONIC COMPONENTS, N.E.C.

This industry is made up of establishments primarily engaged in manufacturing electronic components, not elsewhere classified, such as receiving antennas, switches, and waveguides. Establishments primarily engaged in manufacturing radio and television transmitting antennas are classified in industry 3663. Products of this industry also are collected in the Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components.

The 1987 definition of this industry has been revised from that used in the 1972 Standard Industrial Classification (SIC) manual. However, the SIC number and title are

unchanged. 1972 SIC-based Product Class 36792, Magnetic Recording Media, became part of industry 3695. 1972 SIC-based Product Class 36794, Relay for Electronic Circuitry, became part of industry 3625. 1972 SIC-based Product Class 36797, Printed Circuit Boards, became new industry 3672. Electron tube parts were reclassified from product class 36799 to new industry 3671. The effect of the revisions on the data is summarized in tables 1c-1 and 1c-2. During the 1987 processing, each establishment was classified according to both the old and new SIC. Table 1c-1 shows the distribution of the new industry among the old SIC classifications. Table 1c-2 shows the distribution of the old SIC-based industries among the new SIC classifications.

In the 1987 Census of Manufactures, Industry 3679, Electronic Components, N.E.C., had employment of 162.6 thousand. The leading States in employment in 1987 were California, New York, Texas, and Massachusetts, accounting for 52 percent of the industry's employment.

The total value of shipments for establishments classified in this industry was \$15.4 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3679 shipped \$12.1 billion of electronic components, n.e.c., products considered primary to the industry, \$2.6 billion of secondary products, and had \$740.1 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 83 percent (specialization ratio).

Establishments in this industry also accounted for 83 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). The products primary to industry 3679, no matter in what industry they were produced, appear in table 6a and aggregate to \$14.6 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the electronic components, n.e.c., industry amounted to \$7.3 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 13 percent of total value of shipments.

Table 1a-1. Historical Statistics for the Industry (1987 Basis): 1987 and Earlier Years

[Industries with only 1987 data are revised for 1987. Table 1a-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year ¹	Com- panies ² (no.)	All establishments ³		All employees		Production workers			Value added by manufac- ture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments (million dollars)	New capital expend- itures ⁶ (million dollars)	End-of- year inven- tories ⁴ (million dollars)	Ratios	
		Total (no.)	With 20 employ- ees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Speci- aliza- tion ⁷ (per- cent)	Cover- age ⁸ (per- cent)
INDUSTRY 3671, ELECTRON TUBES⁹															
1987 Census ---	102	121	64	28.4	792.4	20.5	41.2	502.0	1 513.0	1 234.7	2 735.4	103.4	474.2	83	93
INDUSTRY 3672, PRINTED CIRCUIT BOARDS⁹															
1987 Census ---	950	1 009	566	66.6	1 378.5	48.6	100.0	835.5	2 683.1	2 023.8	4 672.6	239.3	586.8	97	92
INDUSTRY 3674, SEMICONDUCTORS AND RELATED DEVICES															
1987 Census ---	757	853	437	184.6	5 494.8	87.4	175.4	1 853.6	13 429.3	6 462.5	19 794.9	1 920.8	2 928.4	96	95
1986 ASM -----	(NA)	(NA)	(NA)	172.9	4 967.1	79.2	155.4	1 687.2	10 910.9	4 784.5	15 785.0	2 220.2	2 576.5	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	190.4	5 016.3	91.8	177.5	1 837.2	10 872.1	5 427.6	16 487.3	2 831.7	2 807.8	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	192.3	5 216.0	96.1	186.6	1 838.1	13 414.3	6 039.5	19 134.5	2 817.6	3 044.2	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	169.3	4 287.1	84.1	161.7	1 464.9	9 991.3	4 640.7	14 339.4	1 831.6	2 626.0	(NA)	(NA)
1982 Census ---	685	766	352	166.5	3 785.0	81.3	154.4	1 313.3	8 356.6	4 196.0	12 429.9	1 723.8	2 260.7	94	96
1981 ASM -----	(NA)	(NA)	(NA)	169.5	3 405.0	84.9	161.1	1 312.2	7 729.8	4 018.3	11 701.5	1 493.1	2 029.1	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	160.7	2 935.8	87.3	170.8	1 177.9	7 055.2	3 816.1	10 500.8	1 595.8	1 978.2	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	142.9	2 249.5	81.1	160.0	935.5	5 591.5	2 958.7	8 266.7	850.5	1 471.6	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	130.8	1 898.9	73.6	145.4	809.6	4 203.1	2 310.1	6 435.4	636.9	1 069.9	(NA)	(NA)
1977 Census ---	502	545	219	114.0	1 601.1	63.5	126.5	670.3	3 409.6	2 011.2	5 322.6	409.0	909.5	93	94
1976 ASM -----	(NA)	(NA)	(NA)	102.5	1 371.2	57.9	118.8	529.6	2 858.8	1 623.7	4 473.8	362.3	812.1	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	96.7	1 200.5	52.4	103.9	451.1	2 182.4	1 093.9	3 276.9	282.9	777.4	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	133.1	1 466.6	81.6	159.1	626.0	2 738.2	1 756.5	4 305.1	479.2	917.0	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	120.0	1 201.0	74.7	148.2	552.7	2 372.9	1 360.9	3 647.7	334.6	660.2	(NA)	(NA)
1972 Census ---	288	325	196	97.6	953.1	58.4	116.3	419.8	1 735.1	931.4	2 704.8	170.5	502.8	89	92
INDUSTRY 3675, ELECTRONIC CAPACITORS															
1987 Census ---	116	148	105	21.7	392.8	16.4	31.7	249.3	892.0	551.3	1 440.1	78.2	358.2	93	97
1986 ASM -----	(NA)	(NA)	(NA)	22.1	380.0	17.0	33.1	243.5	747.2	483.5	1 241.4	75.1	308.7	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	26.5	417.9	20.2	38.3	282.5	851.6	536.1	1 410.0	125.2	349.7	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	32.2	501.8	25.1	50.4	339.0	1 059.0	696.5	1 702.0	111.9	416.0	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	27.9	403.1	21.0	40.5	268.5	813.8	539.0	1 330.6	68.4	333.3	(NA)	(NA)
1982 Census ---	93	130	99	28.9	387.9	21.6	40.7	243.6	728.4	466.9	1 188.9	72.3	289.2	94	90
1981 ASM -----	(NA)	(NA)	(NA)	28.4	363.3	22.2	43.6	239.9	680.1	475.8	1 151.6	76.5	260.9	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	30.6	343.0	24.5	46.4	244.4	728.1	479.7	1 180.2	69.2	260.0	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	31.8	322.3	26.6	52.8	236.2	631.6	393.5	1 005.1	45.6	219.4	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	30.9	290.7	25.5	49.7	201.4	523.9	318.6	830.1	43.0	177.6	(NA)	(NA)
1977 Census ---	86	118	97	28.9	260.5	23.4	45.7	179.0	486.1	266.2	742.3	34.0	152.4	92	91
1976 ASM -----	(NA)	(NA)	(NA)	27.2	227.2	21.5	40.5	150.1	404.3	233.5	629.1	22.5	138.7	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	23.4	183.9	17.9	34.1	120.6	320.7	174.4	506.9	15.7	126.0	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	33.6	232.5	27.6	52.4	161.7	443.4	246.2	672.7	31.2	151.0	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	34.3	218.3	28.5	56.0	158.0	406.6	206.9	605.0	25.8	123.6	(NA)	(NA)
1972 Census ---	79	113	101	27.6	169.2	22.5	44.5	119.6	298.6	152.9	445.8	13.4	99.6	90	87
INDUSTRY 3676, ELECTRONIC RESISTORS															
1987 Census ---	87	118	88	15.7	293.4	10.9	21.4	150.3	602.1	281.3	882.7	43.5	187.1	95	94
1986 ASM -----	(NA)	(NA)	(NA)	17.2	297.2	11.7	22.7	155.8	640.7	276.2	918.9	1069.3	201.9	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	17.3	297.2	11.8	22.8	159.9	643.8	280.9	908.5	1088.0	193.3	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	18.5	294.3	13.0	26.9	159.4	724.1	269.6	983.0	(D)	181.4	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	15.8	246.7	11.0	20.7	125.4	543.0	214.3	761.6	38.6	163.2	(NA)	(NA)
1982 Census ---	77	103	85	18.3	258.4	12.4	23.8	139.1	524.0	238.4	765.8	28.9	164.8	89	88
1981 ASM ¹¹ -----	(NA)	(NA)	(NA)	21.7	295.4	15.0	28.4	168.9	534.1	259.0	784.6	36.1	161.9	(NA)	(NA)
1980 ASM ¹¹ -----	(NA)	(NA)	(NA)	23.3	299.3	16.2	29.9	167.3	550.6	261.1	794.4	49.6	153.6	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	22.8	253.6	17.0	33.2	151.7	484.9	197.8	664.2	36.7	138.9	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	21.5	223.4	16.0	31.2	137.7	411.9	184.9	591.1	22.1	111.8	(NA)	(NA)
1977 Census ---	76	101	80	21.3	210.9	15.9	32.4	130.6	401.0	186.2	578.3	25.1	104.2	87	81
1976 ASM -----	(NA)	(NA)	(NA)	17.4	168.4	12.5	25.7	103.1	316.5	149.1	461.5	18.7	90.9	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	16.6	148.2	11.7	23.0	86.5	266.7	113.7	397.3	9.8	85.6	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	23.4	187.9	17.3	33.8	116.7	335.8	142.3	471.2	21.7	95.1	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	24.3	187.6	18.9	37.8	123.7	339.6	150.0	477.8	18.1	83.8	(NA)	(NA)
1972 Census ---	67	86	78	20.5	144.5	15.7	31.3	93.9	263.5	111.6	372.2	10.4	62.7	90	74
INDUSTRY 3677, ELECTRONIC COILS AND TRANSFORMERS															
1987 Census ---	393	416	246	23.9	396.3	18.3	34.8	238.2	747.9	476.1	1 228.4	29.1	195.2	90	91
1986 ASM -----	(NA)	(NA)	(NA)	20.9	300.4	16.7	31.5	189.6	567.6	373.5	952.4	1015.8	142.1	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	24.0	334.5	19.5	35.9	215.4	682.6	437.3	1 130.2	19.7	166.2	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	25.5	339.2	21.1	41.9	232.7	653.2	446.0	1 085.2	(D)	170.0	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	26.2	346.3	21.2	39.6	219.4	625.9	415.2	1 029.4	31.8	160.6	(NA)	(NA)
1982 Census ---	253	386	245	23.7	293.4	18.7	35.2	183.5	537.6	327.6	863.3	36.5	127.5	91	84
1981 ASM -----	(NA)	(NA)	(NA)	22.5	261.1	18.3	36.4	171.2	481.5	315.9	794.0	25.2	109.6	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	22.5	230.8	18.6	35.3	155.8	424.5	276.6	699.5	21.1	96.7	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	24.3	219.1	19.9	36.9	147.2	397.0	267.8	655.9	16.5	98.6	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	21.3	180.9	17.8	33.1	122.4	323.1	223.7	542.5	15.4	106.2	(NA)	(NA)
1977 Census ---	277	294	194	20.7	166.6	17.1	31.8	113.1	289.1	221.0	506.4	9.5	74.5	91	75
1976 ASM -----	(NA)	(NA)	(NA)	17.9	150.9	14.7	27.3	100.0	249.1	204.2	446.4	7.8	95.0	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	17.0	142.0	13.3	25.3	88.1	229.6	173.0	406.7	13.7	76.0	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	21.9	153.5	18.2	34.2	104.1	268.0	198.0	462.0	10.2	84.9		

Table 1a-1. Historical Statistics for the Industry (1987 Basis): 1987 and Earlier Years—Con.

[Industries with only 1987 data are revised for 1987. Table 1a-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year ¹	Com- panies ² (no.)	All establishments ³		All employees		Production workers			Value added by manufac- ture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments (million dollars)	New capital expendi- tures ⁶ (million dollars)	End-of- year inven- tories ⁷ (million dollars)	Ratios	
		Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Spec- ciali- zation ⁷ (per- cent)	Cover- age ⁸ (per- cent)
INDUSTRY 3678, ELECTRONIC CONNECTORS															
1987 Census	220	271	190	43.8	1 013.2	30.4	61.5	587.7	2 564.8	1 516.9	4 065.0	153.2	800.0	87	92
1986 ASM	(NA)	(NA)	(NA)	38.6	872.1	27.6	53.6	517.7	2 137.0	1 094.0	3 211.8	125.4	668.5	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	39.2	818.3	28.2	52.8	504.2	1 968.6	1 086.4	3 097.8	207.3	645.5	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	39.2	828.4	29.2	56.1	502.8	2 232.3	1 299.5	3 491.6	184.8	672.1	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	36.7	697.9	26.7	52.6	428.5	1 880.0	1 042.5	2 899.0	146.7	590.3	(NA)	(NA)
1982 Census	148	198	159	39.7	687.5	28.0	54.2	418.4	1 633.5	974.9	2 565.0	168.7	603.8	87	91
1981 ASM	(NA)	(NA)	(NA)	35.3	570.3	24.9	49.7	357.5	1 519.6	827.0	2 310.9	117.8	489.0	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	37.0	542.8	27.3	53.8	340.8	1 470.7	827.0	2 269.0	140.9	487.3	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	34.4	465.5	25.4	50.1	287.7	1 306.1	643.7	1 872.8	71.0	417.3	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	30.2	385.6	22.3	43.4	238.2	996.6	472.6	1 417.1	51.6	311.0	(NA)	(NA)
1977 Census	109	133	107	26.0	303.6	19.1	37.6	185.1	754.2	371.7	1 104.6	40.4	234.5	78	86
1976 ASM	(NA)	(NA)	(NA)	22.1	242.3	15.8	30.9	143.3	573.4	277.8	846.0	26.1	199.1	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	22.9	232.7	16.2	31.4	136.6	502.9	245.6	772.6	27.3	187.2	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	24.7	224.2	18.0	35.9	137.4	548.9	259.1	776.2	26.6	191.2	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	23.4	194.4	17.5	35.4	124.0	450.0	226.0	653.8	17.9	139.7	(NA)	(NA)
1972 Census	75	92	80	18.1	141.2	13.5	26.8	90.2	345.6	141.0	483.3	12.2	95.5	87	81
INDUSTRY 3679, ELECTRONIC COMPONENTS, N.E.C.⁹															
1987 Census	2 561	2 900	1 185	162.6	3 890.7	97.3	187.9	1 677.7	8 383.2	7 285.2	15 438.5	533.3	2 852.2	83	83

¹In annual survey of manufactures (ASM) years, data are estimates based on a representative sample of establishments canvassed annually and may differ from results of a complete canvass of all establishments. ASM publication shows percentage standard errors. Unless otherwise noted, for data prior to 1972, see 1972 Census of Manufactures, vol. II, table 1a of the Industry chapter.

²For the Census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

³Includes establishments with payroll at any time during year.

⁴Beginning with the 1982 Census of Manufactures, all respondents were requested to report their inventories at (the lower of) cost or market prior to adjustment to LIFO cost. This is a change from prior Censuses and annual surveys of manufactures in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, inventories and values added by manufacture are not comparable to prior-year data.

⁵Detailed data on materials consumed by type are shown in table 7.

⁶Detailed data on new machinery and equipment expenditures are provided in table 3c.

⁷Represents ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for establishments classified in the industry.

⁸Represents ratio of primary products shipped by establishments classified in industry to total shipments of such products by all manufacturing establishments, wherever classified.

⁹Industry definition is new for 1987 Census of Manufactures. An explanation of the Standard Industrial Classification revision appears in the Summary of Findings of this report.

¹⁰Estimates for new capital expenditures have associated standard errors of 15 percent or more and may be of limited reliability. Estimates for other data items are of acceptable reliability.

¹¹Data either have associated standard errors exceeding 15 percent or are not consistent with other census series and related data; thus, these estimates may be of limited reliability.

Table 1a-2. Historical Statistics for the Industry (1972 Basis): 1987 and Earlier Years

[Table 1a-2 contains the historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Com- panies (no.)	All establishments		All employees		Production workers			Value added by manufac- ture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expendi- tures (million dollars)	End-of- year inven- tories (million dollars)	Ratios	
		Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Spec- ciali- zation (per- cent)	Cover- age (per- cent)
INDUSTRY 3671, ELECTRON TUBES															
1987 Census	67	84	48	25.8	724.5	18.5	36.6	453.8	1 389.0	1 167.7	2 542.8	93.1	444.0	(NA)	(NA)
1986 ASM	(NA)	(NA)	(NA)	27.4	722.1	20.0	39.2	457.6	1 341.0	1 054.8	2 361.0	109.0	408.7	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	28.6	718.8	20.9	42.1	461.3	1 352.5	993.4	2 362.9	160.2	398.8	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	31.3	746.1	22.5	45.2	495.9	1 510.7	1 005.6	2 466.7	134.2	410.4	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	30.6	703.5	22.0	43.5	453.5	1 437.3	965.6	2 417.7	88.8	352.7	(NA)	(NA)
1982 Census	85	102	61	35.5	773.0	24.7	47.5	476.5	1 306.8	979.5	2 302.3	89.0	378.9	78	94
1981 ASM	(NA)	(NA)	(NA)	36.2	711.5	25.5	49.5	437.8	1 193.5	974.7	2 159.9	80.2	346.2	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	38.5	701.4	27.6	53.7	439.7	1 226.1	968.5	2 185.1	60.7	341.3	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	37.9	624.4	27.7	54.2	397.9	1 049.4	844.8	1 870.1	59.1	317.7	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	36.2	551.6	27.0	52.8	354.9	984.4	742.4	1 698.1	47.5	284.0	(NA)	(NA)
1977 Census	125	146	60	36.7	514.1	27.5	53.7	324.5	909.6	683.7	1 581.7	51.2	254.7	78	93
1976 ASM	(NA)	(NA)	(NA)	37.6	477.6	27.8	55.1	301.2	818.6	644.5	1 454.2	44.3	229.7	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	37.8	459.3	27.3	54.6	286.8	738.5	545.3	1 287.3	41.8	209.5	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	44.0	470.8	32.7	63.7	296.9	819.1	582.0	1 407.4	53.8	225.7	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	49.7	509.2	36.4	72.8	313.7	930.7	662.0	1 566.4	58.9	235.2	(NA)	(NA)
1972 Census	133	153	72	47.1	468.4	34.0	67.8	276.8	862.1	553.9	1 406.2	41.5	193.0	87	97
INDUSTRY 3679, ELECTRONIC COMPONENTS, N.E.C.															
1987 Census	3 942	4 159	1 846	250.3	5 729.1	160.9	317.4	2 794.7	12 280.2	10 478.7	22 502.5	918.2	3 732.6	(NA)	(NA)
1986 ASM	(NA)	(NA)	(NA)	217.7	4 767.2	140.4	277.6	2 288.2	9 506.3	7 776.4	17 514.6	803.8	2 920.4	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	232.1	4 748.8	152.8	297.7	2 347.6	9 996.3	7 652.1	17 523.7	1 062.8	3 059.3	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	243.3	4 722.2	167.7	327.6	2 450.2	10 833.0	8 433.4	19 119.6	1 090.3	3 143.4	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	208.5	3 920.7	143.1	283.8	2 054.9	8 318.6	6 094.6	14 415.9	691.3	2 615.3	(NA)	(NA)
1982 Census	3 575	3 770	1 463	203.2	3 584.9	138.2	270.5	1 870.2	8 127.2	6 401.1	14 401.6	893.5	2 611.2	84	78
1981 ASM	(NA)	(NA)	(NA)	190.0	3 057.8	134.7	262.5	1 678.1	6 398.1	5 287.8	11 519.0	629.8	2 348.3	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	186.0	2 726.8	135.1	260.0	1 524.0	5 446.9	4 805.0	10 017.8	678.2	2 070.5	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	173.5	2 327.0	126.9	247.9	1 328.2	4 752.1	3 899.7	8 373.2	511.7	1 712.4	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	141.4	1 762.8	103.8	201.3	1 022.7	3 538.1	2 958.1	6 397.4	302.9	1 214.8	(NA)	(NA)

See footnotes at end of table.

Table 1a-2. Historical Statistics for the Industry (1972 Basis): 1987 and Earlier Years—Con.

[Table 1a-2 contains the historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Com-	All establishments		All employees		Production workers			Value added by manufac-	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)	Ratios	
		panies (no.)	Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)						Specialization (percent)	Coverage (percent)
INDUSTRY 3679, ELECTRONIC COMPONENTS, N.E.C.—Con.															
1977 Census	2 991	3 119	915	126.0	1 500.1	91.4	181.0	855.0	3 006.7	2 651.3	5 551.0	212.3	1 043.9	(NA)	74
1976 ASM	(NA)	(NA)	(NA)	98.3	1 125.8	68.6	140.4	636.3	2 347.2	1 875.1	4 121.6	168.9	754.9	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	87.9	991.0	58.8	117.0	535.6	1 742.8	1 637.8	3 451.3	144.9	588.0	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	101.0	950.4	70.9	140.7	531.4	1 809.6	1 450.8	3 206.3	162.6	621.1	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	119.2	1 021.9	87.4	168.9	595.3	1 871.1	1 655.3	3 428.8	164.8	654.3	(NA)	(NA)
1972 Census	1 745	1 850	706	100.5	846.4	70.6	136.2	458.0	1 577.2	1 425.2	3 046.6	86.1	481.9	(NA)	73

Note: For qualifications of data, see footnotes on table 1a-1.

Table 1b-1. Selected Operating Ratios for the Industry (1987 Basis): 1987 and Earlier Years

[Industries with only 1987 data are revised for 1987. Table 1b-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (dollars)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3671, ELECTRON TUBES									
1987 Census	27 901	72	2 010	12.18	45	74	53 275	52	36.72
INDUSTRY 3672, PRINTED CIRCUIT BOARDS									
1987 Census	20 698	73	2 058	8.35	43	73	40 287	51	26.83
INDUSTRY 3674, SEMICONDUCTORS AND RELATED DEVICES									
1987 Census	29 766	47	2 007	10.57	33	60	72 748	41	76.56
1986 ASM	28 728	46	1 962	10.86	30	62	63 105	46	70.21
1985 ASM	26 346	48	1 934	10.35	33	63	57 101	46	61.25
1984 ASM	27 124	50	1 942	9.85	32	59	69 757	39	71.89
1983 ASM	25 322	50	1 923	9.06	32	62	59 015	43	61.79
1982 Census	22 732	49	1 899	8.51	34	64	50 190	45	54.12
1981 ASM	20 088	50	1 898	8.15	34	63	45 604	44	47.98
1980 ASM	18 268	54	1 956	6.90	36	64	43 903	42	41.31
1979 ASM	15 741	57	1 973	5.85	36	63	39 129	40	34.95
1978 ASM	14 517	56	1 976	5.57	36	65	32 134	45	28.91
1977 Census	14 044	56	1 992	5.30	38	68	29 909	47	26.95
1976 ASM	13 377	56	2 052	4.46	36	67	27 891	48	24.06
1975 ASM	12 414	54	1 983	4.34	33	70	22 569	55	21.00
1974 ASM	11 018	61	1 950	3.93	41	75	20 573	54	17.21
1973 ASM	10 008	62	1 984	3.73	37	70	19 774	51	16.01
1972 Census	9 765	60	1 991	3.61	34	70	17 778	55	14.92
INDUSTRY 3675, ELECTRONIC CAPACITORS									
1987 Census	18 101	76	1 933	7.86	38	66	41 106	44	28.14
1986 ASM	17 194	77	1 947	7.36	39	70	33 810	51	22.57
1985 ASM	15 769	76	1 896	7.38	38	68	32 136	49	22.23
1984 ASM	15 583	78	2 008	6.73	41	70	32 888	47	21.01
1983 ASM	14 448	75	1 929	6.63	41	71	29 168	50	20.09
1982 Census	13 422	75	1 884	5.99	39	72	25 204	53	17.90
1981 ASM	12 792	78	1 964	5.50	41	73	23 947	53	15.60
1980 ASM	11 209	80	1 894	5.27	41	70	23 794	47	15.69
1979 ASM	10 135	84	1 985	4.47	39	71	19 862	51	11.96
1978 ASM	9 407	83	1 949	4.05	38	73	16 955	55	10.54
1977 Census	9 013	81	1 953	3.92	36	71	16 820	54	10.64
1976 ASM	8 352	79	1 884	3.71	37	73	14 864	56	9.98
1975 ASM	7 858	76	1 905	3.54	34	71	13 705	57	9.40
1974 ASM	6 919	82	1 899	3.09	37	71	13 196	52	8.46
1973 ASM	6 364	83	1 965	2.82	34	70	11 854	54	7.26
1972 Census	6 130	82	1 978	2.69	34	72	10 819	57	6.71
INDUSTRY 3676, ELECTRONIC RESISTORS									
1987 Census	18 688	69	1 963	7.02	32	65	38 350	49	28.14
1986 ASM	17 279	68	1 940	6.86	30	62	37 250	46	28.22
1985 ASM	17 179	68	1 932	7.01	31	64	37 214	46	28.24
1984 ASM	15 908	70	(D)	5.93	27	57	39 141	41	26.92
1983 ASM	15 613	70	1 882	6.06	28	61	34 367	45	26.23
1982 Census	14 120	68	1 919	5.84	31	65	28 634	49	22.02
1981 ASM	13 612	69	1 893	5.95	33	71	24 613	55	18.81
1980 ASM	12 845	70	1 846	5.60	33	71	23 631	54	18.41
1979 ASM	11 122	75	1 953	4.57	30	68	21 268	52	14.61
1978 ASM	10 390	74	1 950	4.41	31	69	19 158	54	13.20

See footnotes at end of table.

Table 1b-1. Selected Operating Ratios for the Industry (1987 Basis): 1987 and Earlier Years

—Con.

[Industries with only 1987 data are revised for 1987. Table 1b-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3676, ELECTRONIC RESISTORS—Con.									
1977 Census-----	9 901	75	2 038	4.03	32	69	18 826	53	12.38
1976 ASM-----	9 678	72	2 056	4.01	32	69	18 190	53	12.32
1975 ASM-----	8 927	70	1 966	3.76	29	68	16 066	56	11.60
1974 ASM-----	8 029	74	1 954	3.45	30	70	14 350	56	9.93
1973 ASM-----	7 720	78	2 000	3.27	31	71	13 975	55	8.98
1972 Census-----	7 048	77	1 994	3.00	30	69	12 854	55	8.42
INDUSTRY 3677, ELECTRONIC COILS AND TRANSFORMERS									
1987 Census-----	16 582	77	1 902	6.84	39	71	31 293	53	21.49
1986 ASM-----	14 373	80	1 886	6.02	39	71	27 158	53	18.02
1985 ASM-----	13 937	81	1 841	6.00	39	68	28 442	49	19.01
1984 ASM-----	13 301	83	(D)	5.55	41	72	25 616	52	15.59
1983 ASM-----	13 217	81	1 868	5.54	40	74	23 889	55	15.81
1982 Census-----	12 379	79	1 882	5.21	38	72	22 684	55	15.27
1981 ASM-----	11 604	81	1 989	4.70	40	73	21 400	54	13.23
1980 ASM-----	10 257	83	1 898	4.41	40	73	18 867	54	12.03
1979 ASM-----	9 016	82	1 854	3.99	41	74	16 337	55	10.76
1978 ASM-----	8 492	84	1 860	3.70	41	75	15 169	56	9.76
1977 Census-----	8 048	83	1 860	3.56	44	77	13 966	58	9.09
1976 ASM-----	8 430	82	1 857	3.66	46	80	13 916	61	9.12
1975 ASM-----	8 352	78	1 902	3.48	43	77	13 506	62	9.08
1974 ASM-----	7 009	83	1 879	3.04	43	76	12 237	57	7.84
1973 ASM-----	5 933	83	1 859	2.81	44	79	9 414	63	8.11
1972 Census-----	5 941	80	1 927	2.64	41	81	8 950	66	5.78
INDUSTRY 3678, ELECTRONIC CONNECTORS									
1987 Census-----	23 132	69	2 023	9.56	37	62	58 557	40	41.70
1986 ASM-----	22 593	72	1 942	9.66	34	61	55 363	41	39.87
1985 ASM-----	20 875	72	1 872	9.55	35	61	50 219	42	37.28
1984 ASM-----	21 132	74	1 990	8.65	37	61	56 946	37	38.42
1983 ASM-----	19 016	73	1 970	8.15	36	60	51 226	37	35.74
1982 Census-----	17 317	71	1 936	7.72	38	65	41 146	42	30.14
1981 ASM-----	16 155	71	1 996	7.19	36	60	43 048	38	30.58
1980 ASM-----	14 670	74	1 971	6.33	36	60	39 749	37	27.34
1979 ASM-----	13 531	74	1 972	5.74	34	59	37 968	36	26.07
1978 ASM-----	12 768	74	1 946	5.49	33	61	33 000	39	22.96
1977 Census-----	11 676	73	1 969	4.92	34	61	29 008	40	20.06
1976 ASM-----	10 963	71	1 956	4.64	33	61	25 946	42	18.56
1975 ASM-----	10 161	71	1 938	4.35	32	62	21 961	46	16.02
1974 ASM-----	9 076	73	1 994	3.83	33	62	22 223	41	15.29
1973 ASM-----	8 307	75	2 023	3.50	35	64	19 231	43	12.71
1972 Census-----	7 801	75	1 985	3.37	29	58	19 094	41	12.90
INDUSTRY 3679, ELECTRONIC COMPONENTS, N.E.C.									
1987 Census-----	23 928	60	1 931	8.93	47	72	51 557	46	44.62

Note: For qualifications of data, see footnotes on table 1a-1.

Table 1b-2. Selected Operating Ratios for the Industry (1972 Basis): 1987 and Earlier Years

[Table 1b-2 contains the historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3671, ELECTRON TUBES									
1987 Census-----	28 081	72	1 978	12.40	46	74	53 837	52	37.95
1986 ASM-----	26 354	73	1 960	11.67	45	75	48 941	54	34.21
1985 ASM-----	25 133	73	2 014	10.96	42	72	47 290	53	32.13
1984 ASM-----	23 837	72	2 009	10.17	41	71	48 265	49	33.42
1983 ASM-----	22 990	72	1 977	10.43	40	69	46 971	49	33.04
1982 Census-----	21 775	70	1 923	10.03	43	76	36 811	59	27.51
1981 ASM-----	19 655	70	1 941	8.84	45	78	32 970	60	24.11
1980 ASM-----	18 218	72	1 946	8.19	44	76	31 847	57	22.83
1979 ASM-----	16 475	73	1 957	7.34	45	79	27 689	60	19.38
1978 ASM-----	15 238	75	1 956	6.72	44	76	27 193	56	18.84
1977 ASM-----	14 008	75	1 953	6.04	43	76	24 785	57	18.94
1976 ASM-----	12 702	74	1 982	5.47	44	77	21 771	58	14.88
1975 ASM-----	12 151	72	2 000	5.25	42	78	19 537	62	13.53
1974 ASM-----	10 700	74	1 948	4.66	41	75	18 616	57	12.86
1973 ASM-----	10 245	73	2 000	4.31	42	75	18 726	55	12.78
1972 Census-----	9 945	72	1 994	4.08	39	73	18 304	54	12.72

See footnotes at end of table.

Table 1b-2. Selected Operating Ratios for the Industry (1972 Basis): 1987 and Earlier Years

—Con.

[Table 1b-2 contains the historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3679, ELECTRONIC COMPONENTS, N.E.C.									
1987 Census-----	22 889	64	1 973	8.80	47	72	49 062	47	38.69
1986 ASM-----	21 898	64	1 977	8.24	44	72	43 667	50	34.24
1985 ASM-----	20 460	66	1 948	7.89	44	71	43 069	48	33.58
1984 ASM-----	19 408	69	1 953	7.48	44	69	44 525	44	33.07
1983 ASM-----	18 804	69	1 983	7.24	42	69	39 897	47	29.31
1982 Census-----	17 642	68	1 957	6.91	44	69	39 996	44	30.05
1981 ASM-----	16 093	71	1 949	6.39	46	72	33 674	48	24.37
1980 ASM-----	14 660	73	1 925	5.86	48	75	29 284	50	20.95
1979 ASM-----	13 412	73	1 954	5.36	47	74	27 390	49	19.17
1978 ASM-----	12 466	73	1 939	5.08	46	74	25 022	50	17.58
1977 Census-----	11 905	73	1 980	4.72	48	75	23 863	50	16.61
1976 ASM-----	11 452	70	2 047	4.53	45	73	23 878	48	16.72
1975 ASM-----	11 274	67	1 990	4.58	47	76	19 827	57	14.90
1974 ASM-----	9 409	70	1 984	3.78	45	75	17 917	53	12.86
1973 ASM-----	8 572	73	1 932	3.52	48	78	15 697	55	11.08
1972 Census-----	8 421	70	1 929	3.36	47	75	15 694	54	11.58

Note: For qualifications of data, see footnotes on table 1a-1.

Table 1c-1. 1987 Statistics for the Industry Showing the Distribution of 1987 SIC-Based Industries Among 1972 SIC-Based Industries

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry	All establish- ments (number)	All employees		Production workers			Value added by manufac- ture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expend- itures (million dollars)	End-of- year inventories (million dollars)
		Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
New Industry 3671, Electron Tubes -----	121	28.4	792.4	20.5	41.2	502.0	1 513.0	1 234.7	2 735.4	103.4	474.2
Old Industry 3671, Electron Tubes, All Types -----	84	25.8	724.5	18.5	36.6	453.8	1 389.0	1 167.7	2 542.8	93.1	444.0
Old Industry 3679, Electronic Components, N.E.C. -----	37	2.6	67.8	2.0	4.6	48.1	124.0	67.1	192.6	10.3	30.2
New Industry 3672, Printed Circuit Boards -----	1 009	66.6	1 378.5	48.6	100.0	835.5	2 683.1	2 023.8	4 672.6	239.3	586.8
Old Industry 3679, Electronic Components, N.E.C. -----	1 009	66.6	1 378.5	48.6	100.0	835.5	2 683.1	2 023.8	4 672.6	239.3	586.8
New Industry 3679, Electronic Components, N.E.C. -----	2 900	162.6	3 890.7	97.3	187.9	1 677.7	8 383.2	7 285.2	15 438.5	533.3	2 852.2
Old Industry 3662, Radio and Television Communication Equipment -----	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Old Industry 3679, Electronic Components, N.E.C. -----	2 896	162.0	3 871.9	96.9	186.9	1 667.2	8 347.2	7 257.4	15 371.2	532.3	2 836.2
All other -----	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

Note: For qualifications of data, see footnotes on table 1a-1.

Table 1c-2. 1987 Statistics for the Industry Showing the Distribution of 1972 SIC-Based Industries Among 1987 SIC-Based Industries

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry	All establish- ments (number)	All employees		Production workers			Value added by manufac- ture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expend- itures (million dollars)	End-of- year inventories (million dollars)
		Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
Old Industry 3671, Electron Tubes, All Types -----	84	25.8	724.5	18.5	36.6	453.8	1 389.0	1 167.7	2 542.8	93.1	444.0
New Industry 3671, Electron Tubes -----	84	25.8	724.5	18.5	36.6	453.8	1 389.0	1 167.7	2 542.8	93.1	444.0
Old Industry 3679, Electronic Components, N.E.C. -----	4 159	250.3	5 729.1	160.9	317.4	2 794.7	12 280.2	10 478.7	22 502.5	918.2	3 732.6
New Industry 3625, Relays and Industrial Controls -----	61	7.7	145.1	5.0	9.5	71.3	292.6	138.4	432.6	18.5	98.2
New Industry 3671, Electron Tubes -----	37	2.6	67.8	2.0	4.6	48.1	124.0	67.1	192.6	10.3	30.2
New Industry 3672, Printed Circuit Boards -----	1 009	66.6	1 378.5	48.6	100.0	835.5	2 683.1	2 023.8	4 672.6	239.3	586.8
New Industry 3679, Electronic Components, N.E.C. -----	2 896	162.0	3 871.9	96.9	186.9	1 667.2	8 347.2	7 257.4	15 371.2	532.3	2 836.2
New Industry 3695, Magnetic and Optical Recording Media -----	133	10.1	237.2	7.5	14.6	156.9	784.1	955.8	1 748.6	114.6	160.2
New Industry 3264, Porcelain Electrical Supplies -----	23	1.3	28.7	.9	1.8	15.7	49.4	36.2	84.8	3.2	21.0

Note: For qualifications of data, see footnotes on table 1a-1.

Table 2. Industry Statistics for Selected States: 1987 and 1982

[Excludes data for auxiliaries. States with 150 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1987											1982		
	All establishments		All employees		Production workers			Value added by manufacture	Cost of materials	Value of shipments	New capital expenditures	All employees ²	Value added by manufacture	
	E1	Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)							
INDUSTRY 3671, ELECTRON TUBES														
United States -----	-	121	64	28.4	792.4	20.5	41.2	502.0	1 513.0	1 234.7	2 735.4	103.4	(NA) (NA)	
Arizona -----	-	3	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
California -----	E1	31	17	10.4	340.0	7.1	14.5	208.9	640.7	314.8	952.2	35.7	(D) (NA) (NA)	
Illinois -----	-	5	2	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D) (NA) (NA)	
Indiana -----	-	2	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D) (NA) (NA)	
Kentucky -----	-	3	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D) (NA) (NA)	
Massachusetts -----	-	8	7	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
New Jersey -----	-	17	8	.9	19.7	.6	1.0	7.8	33.3	38.9	71.5	1.4	(NA) (NA)	
New York -----	-	9	7	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D) (NA) (NA)	
Ohio -----	-	6	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D) (NA) (NA)	
Pennsylvania -----	-	9	8	AA	79.7	2.4	5.0	50.2	203.2	200.3	401.4	10.2	(NA) (NA)	
Tennessee -----	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D) (NA) (NA)	
Texas -----	E9	5	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
INDUSTRY 3672, PRINTED CIRCUIT BOARDS														
United States -----	E1	1 009	566	66.6	1 378.5	48.6	100.0	835.5	2 683.1	2 023.8	4 672.6	239.3	(NA) (NA)	
Alabama -----	-	4	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
Arizona -----	E1	20	14	2.1	46.6	1.5	3.2	28.3	125.0	71.5	196.9	15.3	(NA) (NA)	
Arkansas -----	-	2	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
California -----	E2	341	190	18.6	399.7	13.4	28.0	243.8	802.6	550.4	1 345.8	79.4	(NA) (NA)	
Colorado -----	E2	19	7	.5	8.5	.4	.8	6.6	18.7	9.7	27.9	1.8	(NA) (NA)	
Connecticut -----	E1	30	22	2.3	49.8	1.7	3.5	31.7	100.1	67.1	165.1	4.7	(NA) (NA)	
Florida -----	E2	37	24	2.8	52.4	2.2	5.2	35.9	104.0	103.5	205.0	7.6	(NA) (NA)	
Georgia -----	-	11	6	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
Illinois -----	E3	62	35	3.2	58.5	2.3	4.8	33.7	112.1	89.1	199.1	5.8	(NA) (NA)	
Indiana -----	E1	14	11	2.1	34.2	1.7	3.5	24.3	54.7	62.3	115.1	2.0	(NA) (NA)	
Iowa -----	E4	4	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
Kentucky -----	E2	4	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
Maine -----	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
Maryland -----	E2	17	10	1.0	22.4	.8	1.5	13.4	45.0	29.0	75.4	(D)	(NA) (NA)	
Massachusetts -----	E3	53	34	3.9	82.2	2.9	6.1	50.3	151.6	106.7	256.7	15.2	(NA) (NA)	
Michigan -----	E1	25	10	.8	14.1	.6	1.1	7.1	32.1	29.4	60.7	2.3	(NA) (NA)	
Minnesota -----	-	39	27	4.9	99.5	3.7	7.3	64.8	168.4	153.2	319.2	15.7	(NA) (NA)	
Missouri -----	-	7	5	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
New Hampshire -----	-	28	19	2.4	47.1	1.5	3.0	25.5	69.4	91.0	157.8	5.4	(NA) (NA)	
New Jersey -----	E5	30	15	1.1	22.4	.7	1.5	11.5	43.1	32.4	74.9	3.7	(NA) (NA)	
New York -----	-	44	21	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
North Carolina -----	E1	12	8	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
Ohio -----	E1	26	13	.9	14.3	.7	1.3	9.6	29.2	20.1	48.8	(D)	(NA) (NA)	
Oregon -----	E1	16	8	.8	13.8	.6	1.0	9.1	23.6	20.6	44.5	(D)	(NA) (NA)	
Pennsylvania -----	E1	26	11	1.1	20.5	.7	1.5	10.8	38.9	22.1	61.1	1.6	(NA) (NA)	
Rhode Island -----	-	2	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
South Carolina -----	-	3	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
Texas -----	E1	59	31	3.3	69.4	2.4	5.1	39.4	94.2	101.9	197.0	(D)	(NA) (NA)	
Utah -----	E2	7	4	.3	5.6	.2	.4	3.3	12.1	7.3	19.2	(D)	(NA) (NA)	
Virginia -----	-	10	6	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA) (NA)	
Washington -----	E2	13	7	.5	9.5	.4	.8	6.7	18.0	14.5	32.6	3.0	(NA) (NA)	
Wisconsin -----	-	13	6	.6	13.1	.5	.9	7.7	37.2	25.8	63.2	(D)	(NA) (NA)	
INDUSTRY 3674, SEMICONDUCTORS AND RELATED DEVICES														
United States -----	E1	853	437	184.6	5 494.8	87.4	175.4	1 853.6	13 429.3	6 462.5	19 794.9	1 920.8	166.5	8 356.6
Arizona -----	-	29	19	19.9	497.9	8.7	19.3	143.2	1 511.1	407.8	1 902.8	159.8	19.0	651.1
California -----	E2	274	149	58.6	1 833.1	25.4	51.3	575.7	4 756.8	2 046.2	6 790.2	553.6	52.5	2 777.5
Colorado -----	-	20	10	4.1	124.4	1.9	3.9	49.3	212.8	185.2	384.3	45.2	1.8	38.1
Connecticut -----	E1	18	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.6	35.9
Florida -----	-	23	15	5.0	122.0	2.6	5.0	47.6	302.9	121.4	431.2	32.9	5.3	184.0
Idaho -----	-	5	4	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Illinois -----	E4	21	9	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Indiana -----	-	4	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Maine -----	-	5	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Maryland -----	E4	11	6	.9	22.6	.4	.8	10.9	26.7	19.0	48.0	4.6	CC	(D)
Massachusetts -----	E1	80	44	11.6	284.5	6.5	13.6	130.7	578.9	219.4	795.5	78.6	6.1	256.2
Michigan -----	E6	13	5	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Minnesota -----	E8	8	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Missouri -----	-	6	4	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
Nevada -----	E1	3	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Hampshire -----	-	12	6	1.6	30.1	1.2	2.1	18.9	57.9	26.5	83.2	4.7	(NA)	(NA)
New Jersey -----	E2	49	24	3.3	92.1	1.4	2.5	29.7	105.3	43.1	145.0	11.7	3.7	117.9
New Mexico -----	-	7	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
New York -----	-	58	29	16.8	586.0	5.1	10.3	91.4	1 062.4	1 313.6	2 332.9	15.8	925.6	(NA)
North Carolina -----	-	10	5	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)

See footnotes at end of table.

Table 2. Industry Statistics for Selected States: 1987 and 1982—Con.

[Excludes data for auxiliaries. States with 150 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1987											1982	
	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)
	E1	Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)						
INDUSTRY 3674, SEMICONDUCTORS AND RELATED DEVICES—Con.													
Ohio	-	15	6	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	2.1	124.1
Oregon	-	16	10	2.1	62.3	1.0	2.0	20.6	335.8	46.6	381.4	FF	(D)
Pennsylvania	-	43	21	9.7	310.7	6.0	11.1	173.7	830.2	406.4	1 239.2	55.3	8.8
Rhode Island	-	4	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	578.8
South Carolina	-	3	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Tennessee	-	3	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Texas	-	55	29	19.6	620.5	9.5	19.7	217.9	1 525.1	580.7	2 061.3	23.4	1 239.0
Utah	-	7	3	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
Vermont	-	4	1	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
Washington	-	9	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.4	10.2
INDUSTRY 3675, ELECTRONIC CAPACITORS													
United States	E1	148	105	21.7	392.8	16.4	31.7	249.3	892.0	551.3	1 440.1	78.2	28.9
California	-	35	21	3.1	59.4	2.2	4.7	31.5	121.3	52.7	172.2	17.4	3.5
Connecticut	-	7	7	1.3	21.5	1.0	2.0	13.2	42.4	24.7	67.5	3.7	87.2
Florida	-	9	7	1.0	16.2	.7	1.1	7.7	36.0	19.3	56.9	2.5	25.9
Georgia	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Illinois	E3	8	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.7	13.0
Indiana	E1	4	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Kentucky	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Maine	E8	2	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Massachusetts	E1	8	7	1.6	31.4	1.2	2.7	19.3	82.7	61.6	144.8	2.9	57.3
Nebraska	-	2	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
New Jersey	E2	6	4	6	12.2	.4	.8	7.7	22.6	8.9	31.0	.6	17.9
New York	-	14	8	2.2	50.7	1.6	3.1	32.8	117.0	71.9	182.5	2.3	67.1
North Carolina	-	5	5	1.4	26.3	1.2	2.2	19.7	61.5	29.8	92.9	EE	(D)
Pennsylvania	-	10	7	.9	15.2	.6	1.1	8.1	36.4	41.8	77.9	2.4	16.0
South Carolina	-	9	7	4.0	67.4	3.3	6.3	50.3	187.0	101.8	286.8	6.4	147.8
Tennessee	-	4	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Texas	-	3	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Vermont	E2	3	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Virginia	-	3	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Washington	-	2	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Wisconsin	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
INDUSTRY 3676, ELECTRONIC RESISTORS													
United States	E1	118	88	15.7	293.4	10.9	21.4	150.3	602.1	281.3	882.7	43.5	18.3
California	E1	23	17	2.5	55.1	1.3	2.5	17.5	99.7	85.1	183.8	(D)	4.1
Connecticut	E8	5	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.2	4.1
Florida	-	6	4	.6	6.4	.4	.7	3.6	8.9	5.5	15.1	CC	(D)
Illinois	-	7	7	.7	12.2	.5	1.1	7.5	26.9	12.5	39.1	BB	(D)
Indiana	-	6	4	1.9	32.6	1.5	2.3	22.9	52.9	23.4	75.8	EE	(D)
Iowa	-	2	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Maine	-	2	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
Massachusetts	E1	6	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.2	33.5
Michigan	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Minnesota	-	2	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Nebraska	-	3	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
New Hampshire	E2	8	7	1.0	17.1	.8	1.4	9.4	30.3	21.1	50.7	3.4	18.8
New Jersey	-	6	4	.4	9.6	.3	.6	4.2	16.5	4.3	20.6	.3	14.4
New York	E5	4	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
North Carolina	-	4	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.5	46.6
Pennsylvania	-	5	4	.5	11.5	.4	.7	6.6	30.9	13.5	43.7	2.1	41.0
Rhode Island	-	3	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.2	4.2
Texas	-	7	5	2.0	34.3	1.3	2.5	15.5	96.1	28.1	127.3	EE	(D)
Utah	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
INDUSTRY 3677, ELECTRONIC COILS AND TRANSFORMERS													
United States	E1	416	246	23.9	396.3	18.3	34.8	238.2	747.9	476.1	1 228.4	29.1	23.7
Arizona	E1	12	7	.5	7.1	.4	.6	3.6	14.9	9.1	22.9	(D)	.4
Arkansas	E9	4	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	10.9
California	E1	79	33	2.5	46.8	1.8	3.2	24.3	116.9	50.7	165.9	2.5	71.4
Colorado	E1	7	5	.3	5.3	.3	.5	3.2	9.3	5.7	14.8	BB	(D)
Connecticut	E1	14	10	.8	10.0	.6	1.1	6.6	16.2	9.4	25.4	.7	8.6
Florida	E2	17	11	.8	11.3	.7	1.3	7.3	19.4	10.2	29.5	.7	CC
Illinois	E2	51	38	3.2	43.6	2.5	4.8	26.2	69.0	49.7	120.1	4.3	93.5
Indiana	-	17	14	2.3	31.1	1.9	3.7	22.2	58.0	52.5	112.8	2.2	40.6
Iowa	-	2	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Massachusetts	E2	20	11	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.8	14.4

See footnotes at end of table.

Table 2. Industry Statistics for Selected States: 1987 and 1982—Con.

[Excludes data for auxiliaries. States with 150 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1987											1982		
	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)	
	E ¹	Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)							
INDUSTRY 3677, ELECTRONIC COILS AND TRANSFORMERS—Con.														
Michigan	-	8	4	.3	5.3	.3	.5	3.4	8.9	5.8	14.8	(D)	.2	4.8
Minnesota	-	12	11	.9	16.8	.6	1.2	9.0	29.3	16.7	45.7	(D)	1.3	32.4
Missouri	-	6	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
New Hampshire	E3	12	7	.4	7.0	.3	.6	4.2	11.2	7.2	18.0	(D)	.4	7.4
New Jersey	E1	22	10	1.3	22.6	.9	1.5	11.5	40.5	18.5	58.8	1.7	1.1	26.9
New York	E1	40	31	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
North Carolina	E3	5	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Ohio	-	13	7	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Pennsylvania	E3	14	8	.7	11.1	.6	1.0	7.8	22.2	8.3	30.5	(D)	1.5	31.0
South Carolina	E9	3	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
South Dakota	-	3	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Tennessee	-	2	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.6	21.4
Texas	E1	20	9	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.5	8.3
Utah	-	3	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
Virginia	-	4	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Wisconsin	-	7	3	.2	3.1	.2	.3	1.7	4.5	2.8	7.4	(D)	.2	3.5
INDUSTRY 3678, ELECTRONIC CONNECTORS														
United States	E1	271	190	43.8	1 013.2	30.4	61.5	587.7	2 564.8	1 516.9	4 065.0	153.2	39.7	1 633.5
Arizona	-	5	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Arkansas	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
California	E1	69	47	11.5	255.2	7.1	14.0	131.9	514.5	294.8	819.8	31.6	11.7	417.6
Connecticut	E4	20	16	2.9	60.4	2.2	4.2	39.6	110.3	87.1	199.4	4.1	2.9	109.4
Florida	E2	7	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.5	15.0
Illinois	-	18	13	2.6	64.9	1.6	3.5	32.2	135.8	75.2	207.4	7.3	3.8	144.1
Indiana	-	6	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Iowa	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Massachusetts	E1	19	13	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	2.2	76.6
Michigan	-	7	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Minnesota	-	7	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Missouri	-	3	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
New Hampshire	E1	5	5	1.3	29.9	.8	1.7	13.9	68.7	31.3	101.4	(D)	BB	(D)
New Jersey	E2	11	7	.4	9.6	.3	.6	4.4	21.0	12.3	32.7	.7	.3	6.8
New York	-	16	14	6.1	144.0	4.4	9.7	90.0	252.0	89.0	335.1	15.6	5.3	93.6
North Carolina	-	9	8	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Ohio	E2	8	5	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Oklahoma	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Pennsylvania	-	27	23	6.1	145.9	4.8	9.5	102.0	406.5	462.3	863.0	35.5	4.7	310.2
Rhode Island	E1	3	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
South Carolina	E8	5	4	.5	10.3	.5	1.0	7.6	70.4	17.4	89.2	(D)	BB	(D)
Texas	-	9	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.7	18.9
Virginia	-	5	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
INDUSTRY 3679, ELECTRONIC COMPONENTS, N.E.C.														
United States	E1	2 900	1 185	162.6	3 890.7	97.3	187.9	1 877.7	8 383.2	7 285.2	15 438.5	533.3	(NA)	(NA)
Alabama	-	18	6	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Arizona	E1	60	22	2.4	46.1	1.7	3.5	29.7	89.3	41.8	131.2	3.2	(NA)	(NA)
Arkansas	E4	12	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
California	E2	835	336	38.0	910.1	24.5	48.3	462.7	2 001.9	1 174.8	3 165.5	116.5	(NA)	(NA)
Colorado	E1	46	14	1.8	34.2	1.3	2.5	19.0	56.3	57.6	111.1	2.3	(NA)	(NA)
Connecticut	E1	74	33	4.1	95.3	2.5	4.8	40.2	177.9	114.5	290.1	12.1	(NA)	(NA)
Delaware	-	7	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Florida	E1	105	35	7.5	169.2	4.0	7.6	62.9	287.1	181.2	466.1	33.8	(NA)	(NA)
Georgia	E5	29	8	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Idaho	-	6	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Illinois	E1	127	50	8.8	163.8	6.2	12.2	80.9	407.8	216.3	624.1	19.8	(NA)	(NA)
Indiana	E1	48	26	2.9	51.9	2.1	3.8	29.1	82.1	68.1	148.2	12.6	(NA)	(NA)
Iowa	E1	11	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Kansas	E2	30	14	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Maine	E2	13	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Maryland	E3	44	22	1.7	38.5	1.1	2.4	19.7	90.8	47.2	136.2	5.9	(NA)	(NA)
Massachusetts	E1	194	91	11.1	260.0	7.0	13.8	121.8	484.4	302.9	783.5	35.0	(NA)	(NA)
Michigan	E4	56	23	1.7	32.4	1.3	2.4	18.2	63.9	49.5	114.0	4.5	(NA)	(NA)
Minnesota	E2	47	26	2.8	45.6	2.2	4.2	29.3	90.5	83.1	172.9	(D)	(NA)	(NA)
Mississippi	E8	4	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Missouri	E3	21	9	.7	11.1	.5	.9	6.1	20.1	15.9	36.0	.8	(NA)	(NA)
Nebraska	-	5	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Hampshire	E3	40	18	1.5	32.6	1.0	2.1	16.1	58.0	27.5	85.3	2.6	(NA)	(NA)
New Jersey	E1	134	64	7.0	162.8	4.8	9.4	83.8	342.4	209.1	552.5	18.6	(NA)	(NA)
New Mexico	-	8	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)

See footnotes at end of table.

Table 2. Industry Statistics for Selected States: 1987 and 1982—Con.

[Excludes data for auxiliaries. States with 150 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1987											1982	
	All establishments		All employees		Production workers			Value added by manufacture	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)
	E ¹	Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)						
INDUSTRY 3679, ELECTRONIC COMPONENTS, N.E.C.— Con.													
New York	-	221	96	22.5	658.4	10.3	20.6	210.6	1 572.5	948.2	2 525.2	44.7	(NA)
North Carolina	-	45	27	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)
Ohio	E2	82	40	3.8	79.1	2.4	4.8	41.3	166.2	110.4	278.3	7.9	(NA)
Oklahoma	E1	20	7	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)
Oregon	E2	41	14	2.2	49.5	1.5	2.7	24.0	71.4	39.3	110.2	11.3	(NA)
Pennsylvania	E1	134	53	5.6	105.4	3.9	7.5	58.3	210.2	142.7	351.1	17.9	(NA)
Rhode Island	-	15	9	.7	14.5	.5	1.0	7.4	25.4	20.5	44.7	1.9	(NA)
South Carolina	E2	15	5	.6	7.7	.5	1.0	5.7	18.6	19.4	38.5	(D)	(NA)
South Dakota	-	9	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)
Tennessee	E1	27	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)
Texas	-	140	43	12.1	376.1	4.7	7.8	93.8	1 080.5	1 524.0	2 519.6	(D)	(NA)
Utah	E9	22	3	.3	6.0	.2	.3	2.1	12.9	7.9	22.0	(D)	(NA)
Virginia	E2	30	13	.7	12.7	.4	.8	5.5	27.7	19.7	47.1	1.6	(NA)
Washington	E1	51	17	2.4	69.6	.9	1.8	15.4	95.7	62.6	160.0	6.0	(NA)
Wisconsin	-	35	15	1.4	28.0	1.0	1.9	13.8	68.5	71.5	140.7	7.1	(NA)

Note: For qualifications of data, see footnotes on table 1a-1.

¹Payroll and sales data for some small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other Government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown for those States where estimated value of shipments data based on administrative-record data account for 10 percent or more of figure shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Statistics for some producing States have been withheld to avoid disclosing data for individual companies. However, for States with 150 employees or more, number of establishments is shown and employment-size range is indicated by one of the following symbols: AA—150 to 249 employees; BB—250 to 499 employees; CC—500 to 999 employees; EE—1,000 to 2,499 employees; FF—2,500 employees or more.

Table 3a. Summary Statistics for the Industry: 1987

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Electron tubes (SIC 3671)	Printed circuit boards (SIC 3672)	Semiconductors and related devices (SIC 3674)	Electronic capacitors (SIC 3675)	Electronic resistors (SIC 3676)	Electronic coils and transformers (SIC 3677)	Electronic connectors (SIC 3678)	Electronic components, n.e.c. (SIC 3679)
Companies—number	102	950	757	116	87	393	220	2 561
All establishments	do	121	1 009	853	148	118	416	271
With 1 to 19 employees	do	57	443	416	43	30	170	81
With 20 to 99 employees	do	24	389	215	49	40	177	84
With 100 employees or more	do	40	177	222	56	48	69	106
Employment and labor costs:								
Employees	1,000	28.4	66.6	184.6	21.7	15.7	23.9	43.8
Compensation, total	mil dol.	987.7	1 660.4	6 607.5	506.0	367.1	491.4	1 246.8
Annual payroll	do	792.4	1 378.5	5 494.8	392.8	293.4	396.3	1 013.2
Fringe benefits	do	195.3	282.0	1 112.8	113.2	73.7	95.1	233.6
Social Security and other legally required payments	do	70.7	126.4	471.0	39.6	29.1	37.5	91.2
Employer payments and other programs	do	124.7	155.5	641.8	73.6	44.6	57.6	142.4
Production workers:								
Average for year	1,000	20.5	48.6	87.4	16.4	10.9	18.3	30.4
March	do	20.3	46.7	86.7	17.9	10.5	18.1	30.2
May	do	20.5	47.5	86.5	16.1	10.6	18.1	30.4
August	do	20.6	49.4	87.9	15.9	11.0	18.3	30.6
November	do	20.7	50.5	88.3	15.7	11.2	18.3	30.2
Hours	millions	41.2	100.0	175.4	31.7	21.4	34.8	61.5
January to March	do	10.3	23.7	42.8	8.6	5.2	8.6	15.4
April to June	do	10.5	24.5	43.9	8.0	5.3	8.7	15.5
July to September	do	10.0	25.3	44.2	7.6	5.4	8.7	15.4
October to December	do	10.3	26.4	44.6	7.6	5.5	8.8	15.2
Wages	mil dol.	502.0	835.5	1 853.6	249.3	150.3	298.2	587.7
Value added by manufacture	do	1 513.0	2 683.1	13 429.3	892.0	602.1	747.9	2 564.8
Cost of materials ¹	do	1 234.7	2 023.8	6 462.5	551.3	281.3	476.1	1 516.9
Materials, parts, containers, etc., consumed ²	do	1 062.5	1 813.2	4 444.9	475.8	237.1	438.6	1 375.2
Resales	do	60.9	46.6	1 359.2	31.7	18.4	15.1	34.3
Fuels	do	13.5	16.0	44.8	5.6	2.3	2.6	6.0
Purchased electricity	do	52.7	71.3	368.8	28.2	15.9	9.6	41.1
Contract work	do	45.2	76.7	244.8	9.9	7.5	10.3	60.3
Quantity of electric energy used for heat and power:								
Purchased	mil kWh	957.8	1 184.8	6 520.1	541.6	269.6	178.7	648.0
Generated less sold	do	(D)	(D)	(D)	-	(D)	(D)	(D)

See footnotes at end of table.

Table 3a. Summary Statistics for the Industry: 1987—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Electron tubes (SIC 3671)	Printed circuit boards (SIC 3672)	Semiconductors and related devices (SIC 3674)	Electronic capacitors (SIC 3675)	Electronic resistors (SIC 3676)	Electronic coils and transformers (SIC 3677)	Electronic connectors (SIC 3678)	Electronic components, n.e.c. (SIC 3679)
Total value of shipments	2 735.4	4 672.6	19 794.9	1 440.1	882.7	1 228.4	4 065.0	15 438.5
Primary products	2 174.4	4 413.9	17 117.5	1 265.1	809.0	1 077.8	3 447.0	12 133.1
Secondary products	432.9	143.6	801.4	97.9	46.6	123.4	522.7	2 565.3
Miscellaneous receipts, total	128.1	115.1	1 876.0	77.2	27.2	27.3	95.3	740.1
Value of resales	75.8	65.7	1 625.1	45.5	26.5	19.7	60.5	287.4
Contract receipts	(D)	23.4	43.7	(D)	—	6.2	(D)	310.0
Receipts for repair work	(D)	(D)	.6	(D)	—	.7	(D)	10.5
Receipts for installation or construction of products of this establishment	—	(D)	—	—	—	—	(D)	(D)
Receipts for research and developmental work	(D)	3.0	141.9	(D)	—	—	(D)	92.0
Other miscellaneous receipts, including sales of scrap and refuse	(D)	4.1	64.7	1.4	.7	.6	(D)	(D)
Inventories by stage of fabrication:								
Beginning of 1987	449.0	532.3	2 823.6	349.7	183.5	204.7	773.3	2 580.5
Finished goods	91.1	49.1	613.2	104.0	55.1	34.1	251.3	300.7
Work in process	210.9	264.3	1 601.2	133.4	69.3	61.1	351.5	1 560.6
Materials and supplies	147.1	218.8	609.2	112.3	59.2	109.4	170.5	719.2
End of 1987	do	474.2	586.8	2 928.4	358.2	187.1	195.2	800.0
Finished goods	do	93.7	54.9	609.4	103.7	58.9	29.4	248.3
Work in process	do	220.6	292.9	1 701.9	136.9	66.1	61.6	371.2
Materials and supplies	do	160.0	239.0	617.1	117.6	62.1	104.3	180.5
Primary product specialization ratio	percent	83	97	96	93	95	90	87
Coverage ratio	do	93	92	95	97	94	91	92
								83

Note: For qualifications of data, see footnotes on table 1a-1.

¹Data on purchased services for the repair of buildings and machinery and for communication services are not included in cost of materials, etc., but are shown in table 3c.

²Data on materials consumed by type are shown in table 7. Data on amount purchased or transferred from foreign sources are shown in table 3c.

Table 3b. Gross Book Value of Depreciable Assets, Capital Expenditures, Retirements, Depreciation, and Rental Payments: 1987

[Million dollars. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Electron tubes (SIC 3671)	Printed circuit boards (SIC 3672)	Semiconductors and related devices (SIC 3674)	Electronic capacitors (SIC 3675)	Electronic resistors (SIC 3676)	Electronic coils and transformers (SIC 3677)	Electronic connectors (SIC 3678)	Electronic components, n.e.c. (SIC 3679)
Gross book value of depreciable assets:								
Total:								
Beginning of year	1 178.5	1 919.7	16 514.5	868.2	480.4	344.2	1 642.2	5 965.3
New capital expenditures ¹	103.4	239.3	1 920.8	78.2	43.5	29.1	153.2	533.3
Used capital expenditures	21.1	21.4	94.0	9.2	4.1	3.6	20.3	33.3
Retirements	28.0	85.7	1 441.6	62.1	18.0	23.0	111.3	251.7
End of year	1 275.1	2 094.7	17 087.7	893.5	510.0	353.8	1 704.4	6 280.2
Buildings and other structures:								
Beginning of year	318.3	508.7	4 390.2	178.8	115.3	86.2	374.7	1 901.8
New capital expenditures	13.1	29.2	240.4	10.1	4.5	6.0	17.3	77.5
Used capital expenditures	7.1	10.9	45.9	5.1	.6	1.5	3.0	12.5
Retirements	4.0	14.8	212.4	2.1	.7	1.1	20.4	29.8
End of year	334.5	534.1	4 454.1	192.0	119.8	92.6	374.5	1 962.0
Machinery and equipment:								
Beginning of year	860.2	1 410.9	12 134.2	689.4	365.0	258.0	1 267.6	4 063.5
New capital expenditures ¹	90.3	210.1	1 680.4	68.1	39.0	23.1	135.9	455.8
Used capital expenditures	14.1	10.5	48.1	4.0	3.5	2.0	17.3	20.8
Retirements	24.0	70.9	1 229.2	60.0	17.3	21.9	90.9	221.9
End of year	940.6	1 560.6	12 633.5	701.5	390.2	261.2	1 329.9	4 318.2
Depreciation charges during 1987:								
Total	99.3	207.8	1 718.8	62.8	42.1	34.5	154.1	550.7
Buildings and other structures	13.4	28.3	253.4	8.9	6.1	4.2	22.2	90.5
Machinery and equipment	85.9	179.5	1 465.4	53.8	36.0	30.3	131.9	460.2
Rental payments:								
Total	14.5	62.4	203.1	10.6	10.0	10.8	32.2	130.4
Buildings and other structures	6.6	34.5	115.6	4.0	5.6	4.6	15.6	78.8
Machinery and equipment	7.9	27.9	87.5	6.6	4.4	6.2	16.5	51.7

Note: Retirements and depreciation data for establishments not included in the ASM sample were extrapolated from the historical ratio of retirements or depreciation to assets. These ratios were developed at the industry level.

¹Data on new machinery and equipment expenditures by type are provided in table 3c.

Table 3c. Supplemental Industry Statistics Based on Sample Estimates: 1987

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Electron tubes (SIC 3671)		Printed circuit boards (SIC 3672)		Semiconductors and related devices (SIC 3674)		Electronic capacitors (SIC 3675)	
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Purchased services:								
Cost of purchased services for the repair of-								
Buildings and other structures	3.8	(X)	(S)	(X)	199.6	(X)	(S)	(X)
Response coverage ratio (percent) ²	73.5	(X)	(S)	(X)	72.4	(X)	(S)	(X)
Machinery	16.3	(X)	(S)	(X)	225.3	(X)	6.8	(X)
Response coverage ratio (percent) ²	74.8	(X)	(S)	(X)	74.6	(X)	52.0	(X)
Cost of purchased communication services	6.7	(X)	(S)	(X)	42.0	(X)	3.3	(X)
Response coverage ratio (percent) ²	63.0	(X)	(S)	(X)	63.3	(X)	53.4	(X)
New machinery and equipment expenditures	90.3	(X)	210.1	(X)	1 680.4	(X)	68.1	(X)
Automobiles, trucks, etc.3	65	2.0	18	3.0	7	.4	56
Computers and peripheral	3.6	1	16.6	9	170.9	1	3.9	6
All other	86.4	1	191.5	1	1 506.4	1	63.8	1
Adjustment ratio ³	1.2	(X)	1.6	(X)	1.2	(X)	1.3	(X)
Cost of materials, components, parts, etc., used	1 062.5	(X)	1 813.2	(X)	4 444.9	(X)	475.8	(X)
Materials purchased or transferred from foreign sources ⁴	91.5	3	83.6	12	713.7	2	59.3	3
Materials purchased or transferred from domestic sources	971.0	1	1 729.6	1	3 731.2	1	416.5	1
Adjustment ratio ³	1.5	(X)	1.9	(X)	1.7	(X)	1.6	(X)
Item	Electronic resistors (SIC 3676)		Electronic coils and transformers (SIC 3677)		Electronic connectors (SIC 3678)		Electronic components, n.e.c. (SIC 3679)	
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Purchased services:								
Cost of purchased services for the repair of-								
Buildings and other structures	1.4	(X)	(S)	(X)	5.6	(X)	43.1	(X)
Response coverage ratio (percent) ²	71.9	(X)	(S)	(X)	64.5	(X)	54.3	(X)
Machinery	4.6	(X)	(S)	(X)	20.5	(X)	44.7	(X)
Response coverage ratio (percent) ²	72.9	(X)	(S)	(X)	66.8	(X)	56.5	(X)
Cost of purchased communication services	3.3	(X)	(S)	(X)	9.9	(X)	33.4	(X)
Response coverage ratio (percent) ²	78.9	(X)	(S)	(X)	63.5	(X)	55.0	(X)
New machinery and equipment expenditures	39.0	(X)	(S)	(X)	135.9	(X)	455.8	(X)
Automobiles, trucks, etc.4	6	(S)	(S)	.7	29	8.7	5
Computers and peripheral	6.4	6	(S)	(S)	10.9	8	71.5	3
All other	32.2	2	(S)	(S)	124.3	1	375.6	1
Adjustment ratio ³	1.4	(X)	(S)	(X)	1.5	(X)	1.9	(X)
Cost of materials, components, parts, etc., used	237.1	(X)	(S)	(X)	1 375.2	(X)	6 583.7	(X)
Materials purchased or transferred from foreign sources ⁴	24.8	13	(S)	(S)	50.9	4	774.1	3
Materials purchased or transferred from domestic sources	212.3	2	(S)	(S)	1 324.2	1	5 809.6	1
Adjustment ratio ³	1.6	(X)	(S)	(X)	1.3	(X)	1.4	(X)

¹For description of relative standard error of estimate, see Qualifications of the Data in appendixes.

²Measure of extent to which respondents reported each item. Derived for each item by calculating the ratio of weighted employment for those sample establishments that reported the specific inquiry to total employment for all establishments classified in industry. (See appendixes for explanation of sample weight.)

³Detail has been adjusted upwards to account for nonresponse. Inverse of the ratio shown represents a measure of the response to the inquiry. (See appendixes for further explanation.)

⁴Data may underestimate the true cost of imported parts, components, and supplies since some respondents do not know the origin of these materials. Includes cases where materials were purchased from secondary suppliers or where they were transferred from company-operated warehouses or other distribution points. Direct purchases from foreign suppliers and importers by domestic manufacturing establishments are believed to be reported accurately.

Table 4. Industry Statistics by Employment Size of Establishment: 1987

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E ¹	All establish- ments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of- year inven- tories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 3671, ELECTRON TUBES												
Total	-	121	28.4	792.4	20.5	41.2	502.0	1 513.0	1 234.7	2 735.4	103.4	474.2
Establishments with an average of—												
1 to 4 employees	E2	24	.1	.8	(Z)	.1	.4	5.4	3.2	8.8	.5	1.7
5 to 9 employees	E6	14	.1	1.7	.1	.1	1.0	3.2	3.2	6.5	.2	1.1
10 to 19 employees	E4	19	.3	5.5	.2	.4	3.3	10.7	7.5	18.1	.6	2.9
20 to 49 employees	E2	11	.4	8.2	.3	.6	4.4	21.4	5.9	26.8	.5	3.6
50 to 99 employees	E1	13	.9	22.2	.6	1.0	10.0	37.7	16.5	53.6	1.9	12.5
100 to 249 employees	-	12	1.8	38.9	1.3	2.3	20.9	79.0	75.3	149.7	3.0	30.7
250 to 499 employees	E2	9	3.0	79.6	2.2	4.7	50.7	170.8	77.6	245.9	7.7	57.4
500 to 999 employees	-	12	8.0	204.7	5.8	11.4	138.4	396.7	290.8	677.3	30.1	135.3
1,000 to 2,499 employees	-	6	13.9	430.7	10.1	20.6	272.7	788.1	754.9	1 548.5	59.0	229.1
2,500 employees or more	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	40	.3	4.1	.2	.4	2.5	7.6	6.4	13.9	.6	2.3

See footnotes at end of table.

Table 4. Industry Statistics by Employment Size of Establishment: 1987—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E1	All establishments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 3672, PRINTED CIRCUIT BOARDS												
Total	E1	1 009	66.6	1 378.5	48.6	100.0	835.5	2 683.1	2 023.8	4 672.6	239.3	586.8
Establishments with an average of—												
1 to 4 employees	E9	156	.3	5.9	.2	.4	3.2	13.2	12.3	25.1	2.0	4.7
5 to 9 employees	E8	116	.8	15.4	.5	1.0	8.2	31.8	24.6	56.0	2.2	9.3
10 to 19 employees	E5	171	2.4	44.6	1.7	3.0	25.6	91.0	60.6	151.8	6.8	23.0
20 to 49 employees	E2	244	7.9	159.5	5.7	11.3	93.9	309.7	217.2	524.5	20.7	64.9
50 to 99 employees	-	145	10.2	204.5	7.4	14.8	122.0	397.3	268.7	664.5	35.2	76.7
100 to 249 employees	E1	117	17.6	337.2	13.1	27.0	204.9	646.6	518.7	1 158.6	43.0	164.8
250 to 499 employees	-	44	14.8	308.0	10.6	23.2	186.4	600.9	494.6	1 077.8	66.6	134.9
500 to 999 employees	-	15	12.7	303.2	9.5	19.1	191.2	592.5	427.1	1 014.3	62.9	108.6
1,000 to 2,499 employees	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	375	2.8	43.1	1.9	3.4	23.0	86.0	68.7	154.7	5.5	25.8
INDUSTRY 3674, SEMICONDUCTORS AND RELATED DEVICES												
Total	E1	853	184.6	5 494.8	87.4	175.4	1 853.6	13 429.3	6 462.5	19 794.9	1 920.8	2 928.4
Establishments with an average of—												
1 to 4 employees	E9	192	.4	9.3	.2	.3	3.4	22.1	9.6	31.7	3.1	5.2
5 to 9 employees	E9	116	.8	17.7	.4	.7	6.4	40.2	19.8	60.5	5.3	10.1
10 to 19 employees	E7	108	1.4	36.5	.7	1.5	15.0	82.4	38.4	120.5	10.5	20.2
20 to 49 employees	E5	136	4.1	94.1	2.3	4.5	41.2	199.1	114.4	309.0	23.3	57.2
50 to 99 employees	E4	79	5.5	146.1	3.1	5.8	56.7	289.4	166.9	453.9	32.7	85.4
100 to 249 employees	E2	85	13.6	338.3	7.9	14.9	145.1	699.4	409.5	1 100.5	91.0	228.0
250 to 499 employees	-	59	20.7	567.2	11.2	22.3	218.1	1 725.7	772.0	2 486.1	171.7	329.1
500 to 999 employees	E2	35	24.9	640.3	14.4	29.5	278.5	1 490.5	678.7	2 171.5	199.3	424.7
1,000 to 2,499 employees	-	28	40.2	1 180.3	20.8	41.0	450.3	3 323.0	1 397.2	4 695.2	459.4	616.4
2,500 employees or more	-	15	73.0	2 465.0	26.6	54.9	639.0	5 557.5	2 856.1	8 366.1	924.3	1 152.2
Covered by administrative records ²	E9	376	3.0	61.7	1.4	2.7	22.3	146.5	63.7	210.2	21.6	34.3
INDUSTRY 3675, ELECTRONIC CAPACITORS												
Total	E1	148	21.7	392.8	16.4	31.7	249.3	892.0	551.3	1 440.1	78.2	358.2
Establishments with an average of—												
1 to 4 employees	E9	16	(Z)	.4	(Z)	(Z)	.2	.7	.5	1.2	(Z)	.3
5 to 9 employees	E9	12	.1	1.5	.1	.1	1.0	3.0	2.1	5.1	.3	1.3
10 to 19 employees	E8	15	.2	3.0	.2	.3	1.9	5.4	3.6	8.9	.2	2.1
20 to 49 employees	E4	25	.8	13.9	.6	1.2	7.8	26.2	14.4	40.6	2.2	9.4
50 to 99 employees	E3	24	1.8	32.6	1.3	2.6	18.5	56.4	34.9	91.6	3.8	19.2
100 to 249 employees	-	31	5.0	79.8	3.8	7.5	50.0	179.8	101.3	286.7	14.2	68.7
250 to 499 employees	-	15	5.9	113.0	4.2	8.0	64.9	251.5	183.9	436.5	20.3	108.6
500 to 999 employees	E1	9	7.9	148.6	6.3	11.9	105.0	369.0	210.6	569.5	37.2	148.5
1,000 to 2,499 employees	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	35	.3	4.5	.2	.4	2.9	8.3	5.7	13.9	.4	3.4
INDUSTRY 3676, ELECTRONIC RESISTORS												
Total	E1	118	15.7	293.4	10.9	21.4	150.3	602.1	281.3	882.7	43.5	187.1
Establishments with an average of—												
1 to 4 employees	E8	10	(Z)	.3	(Z)	(Z)	.2	.7	.2	.9	.1	.2
5 to 9 employees	E8	7	(Z)	1.0	(Z)	.1	.5	2.2	.7	3.0	.3	.6
10 to 19 employees	E3	13	.2	2.8	.1	.2	1.5	7.0	4.6	11.5	.7	2.4
20 to 49 employees	E2	21	.7	13.1	.5	1.0	6.6	30.8	14.9	45.7	1.2	6.3
50 to 99 employees	E4	19	1.4	29.2	1.1	2.0	13.0	51.4	24.0	75.0	5.0	12.7
100 to 249 employees	E1	26	3.8	69.5	2.7	5.4	37.2	153.2	55.7	206.5	9.0	48.5
250 to 499 employees	-	17	6.0	113.6	4.0	8.3	55.6	190.5	126.2	316.8	12.7	63.7
500 to 999 employees	-	4	3.5	69.8	2.5	4.5	35.7	166.3	55.0	223.3	14.5	52.7
1,000 to 2,499 employees	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	21	.2	2.9	.1	.2	1.5	6.4	2.1	8.6	1.0	1.7
INDUSTRY 3677, ELECTRONIC COILS AND TRANSFORMERS												
Total	E1	416	23.9	396.3	18.3	34.8	238.2	747.9	476.1	1 228.4	29.1	195.2
Establishments with an average of—												
1 to 4 employees	E9	61	.1	1.9	.1	.2	1.2	3.7	2.3	6.0	.1	.9
5 to 9 employees	E8	42	.3	5.1	.2	.4	3.2	10.2	6.7	16.8	.4	2.5
10 to 19 employees	E4	67	1.0	15.5	.7	1.4	9.4	36.0	17.4	53.4	.9	6.6
20 to 49 employees	E3	97	3.0	46.8	2.2	4.2	26.6	84.0	46.8	131.5	3.3	18.4
50 to 99 employees	E2	80	5.8	88.2	4.5	8.5	54.9	155.7	92.1	247.2	4.4	38.0
100 to 249 employees	E1	58	8.9	157.8	6.6	12.7	91.2	290.8	177.6	472.6	11.9	80.5
250 to 499 employees	-	9	4.9	81.2	3.8	7.3	51.8	167.4	133.2	300.9	8.0	48.3
500 to 999 employees	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
1,000 to 2,499 employees	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	148	1.3	16.0	1.0	1.8	10.0	32.1	19.5	51.6	1.2	7.7

See footnotes at end of table.

Table 4. Industry Statistics by Employment Size of Establishment: 1987—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	All establish- ments (no.)	All employees		Production workers			Value added by manufac- ture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)	
		Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
INDUSTRY 3678, ELECTRONIC CONNECTORS												
Total	E1	271	43.8	1 013.2	30.4	61.5	587.7	2 564.8	1 516.9	4 065.0	153.2	800.0
Establishments with an average of—												
1 to 4 employees	E6	27	.1	.9	(Z)	.1	.6	3.0	1.6	4.6	.1	1.2
5 to 9 employees	E9	28	.2	4.3	.1	.3	2.5	11.5	4.9	16.4	.5	3.4
10 to 19 employees	E7	26	.4	7.5	.3	.5	4.8	16.9	7.8	24.9	.8	4.3
20 to 49 employees	E4	49	1.5	30.6	1.1	2.2	17.6	76.5	40.3	120.5	4.5	20.3
50 to 99 employees	E1	35	2.6	51.8	1.9	3.9	29.3	104.6	62.7	170.7	4.8	36.6
100 to 249 employees	E1	55	9.1	196.2	6.7	14.0	115.6	555.4	280.7	828.0	31.5	181.4
250 to 499 employees	E1	33	11.6	255.9	8.9	18.4	179.4	732.6	494.2	1 207.5	35.4	270.6
500 to 999 employees	-	12	8.0	205.3	5.4	10.7	120.9	598.7	448.9	1 041.0	28.6	164.7
1,000 to 2,499 employees	-	5	10.3	260.6	6.1	11.4	116.9	465.5	175.8	651.5	47.1	117.4
2,500 employees or more	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	77	.9	16.1	.6	1.2	9.5	43.5	18.6	62.1	2.0	12.9
INDUSTRY 3679, ELECTRONIC COMPONENTS, N.E.C.												
Total	E1	2 900	162.6	3 890.7	97.3	187.9	1 677.7	8 383.2	7 285.2	15 438.5	533.3	2 852.2
Establishments with an average of—												
1 to 4 employees	E8	939	1.6	32.8	1.2	2.2	17.6	68.4	54.2	122.5	4.3	22.9
5 to 9 employees	E8	379	2.6	47.6	1.7	3.2	25.0	96.3	78.1	174.6	6.0	29.1
10 to 19 employees	E7	397	5.5	105.8	3.6	6.7	55.2	220.1	147.0	367.2	13.0	58.3
20 to 49 employees	E5	528	16.8	326.5	11.4	21.8	170.6	631.9	447.4	1 073.1	36.1	185.1
50 to 99 employees	E5	300	20.7	423.2	14.1	27.5	219.0	855.2	565.2	1 417.7	46.2	257.5
100 to 249 employees	E2	235	35.9	722.4	25.1	49.6	388.5	1 717.1	1 017.4	2 717.1	108.2	499.2
250 to 499 employees	-	83	29.9	704.8	19.6	38.0	371.0	1 492.0	1 248.8	2 729.3	77.6	514.2
500 to 999 employees	-	32	49.7	1 527.7	20.6	38.8	430.7	3 302.3	3 727.1	6 837.1	242.0	1 285.9
1,000 to 2,499 employees	-	4	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2,500 employees or more	-	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	1 262	7.3	110.9	5.0	8.9	59.3	227.6	181.7	409.3	14.5	68.4

Note: For qualifications of data, see footnotes on table 1a-1. Data shown as a (D) are included in underscored figures above.

¹Payroll and sales data for some small single unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other Government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown for those employment-size classes where estimated data based on administrative-record data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Report forms were not mailed to small single unit companies with up to 20 employees (cutoff varied by industry). Payroll and sales data for 1987 were obtained from administrative records supplied by other agencies of the Federal Government. Those data were then used in conjunction with industry averages to estimate the items shown. Data are also included in respective employment-size classes shown.

Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1987

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Indus- try or prod- uct class code	Industry or primary product class	All estab- lish- ments (number)	All employees		Production workers			Value added by manufac- ture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expend- itures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
3671 Electron tubes:											
	All establishments in industry	121	28.4	792.4	20.5	41.2	502.0	1 513.0	1 234.7	2 735.4	103.4
Establishments with this product class primary:											
36713	Transmitting, industrial, and special purpose electron tubes, except x-ray	35	17.5	519.1	11.9	22.6	309.4	1 004.6	581.7	1 574.2	57.0
36714	Receiving type electron tubes, including cathode ray picture tubes	18	9.0	229.0	7.1	15.1	163.5	426.1	612.7	1 037.9	42.6
36715	Electron tube parts	18	1.6	37.0	1.2	2.9	24.6	68.5	31.5	100.7	2.8
3672 Printed circuit boards:											
	All establishments in industry	1 009	66.6	1 378.5	48.6	100.0	835.5	2 683.1	2 023.8	4 672.6	239.3
3674 Semiconductors and related devices:											
	All establishments in industry	853	184.6	5 494.8	87.4	175.4	1 853.6	13 429.3	6 462.5	19 794.9	1 920.8
Establishments with this product class primary:											
36741	Integrated microcircuits	195	129.8	4 184.4	57.4	114.7	1 288.9	10 475.9	4 791.9	15 202.2	1 589.6
36742	Transistors	18	13.4	316.6	6.2	13.3	116.6	783.0	245.9	1 010.2	67.1
36743	Diodes and rectifiers	32	8.4	186.7	4.5	9.6	86.4	362.0	198.7	565.2	37.8
36749	Semiconductor and related devices, n.e.c.	130	23.4	599.7	14.9	29.3	289.0	1 323.9	1 037.1	2 339.1	161.4
3675 Electronic capacitors:											
	All establishments in industry	148	21.7	392.8	16.4	31.7	249.3	892.0	551.3	1 440.1	78.2
3676 Electronic resistors:											
	All establishments in industry	118	15.7	293.4	10.9	21.4	150.3	602.1	281.3	882.7	43.5
3677 Electronic coils and transformers:											
	All establishments in industry	416	23.9	396.3	18.3	34.8	238.2	747.9	476.1	1 228.4	29.1

See footnotes at end of table.

Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1987—Con.

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendices]

Industry or product class code	Industry or primary product class	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
3678	Electronic connectors: All establishments in industry	271	43.8	1 013.2	30.4	61.5	587.7	2 564.8	1 516.9	4 065.0	153.2
	Establishments with this product class primary:										
36781	Coaxial (rf) connectors	25	6.3	153.2	4.6	9.4	86.6	400.0	172.1	559.6	22.4
36782	Cylindrical connectors	20	11.0	246.7	6.8	13.8	130.4	488.9	210.5	708.3	20.2
36783	Rack and panel (rectangular) connectors	20	3.7	80.0	2.9	5.8	57.3	327.0	213.4	538.5	11.0
36784	Printed circuit connectors	58	10.0	227.9	7.2	14.4	141.6	591.6	515.1	1 110.1	36.8
36785	Other connectors for electronic circuitry, n.e.c.	57	11.0	274.3	7.6	15.5	153.2	679.8	361.9	1 027.9	60.0
3679	Electronic components, n.e.c.: All establishments in industry	2 900	162.6	3 890.7	97.3	187.9	1 677.7	8 383.2	7 285.2	15 438.5	533.3
	Establishments with this product class primary:										
36791	Crystals, filters, piezoelectric, and other related devices	91	10.7	200.9	7.5	15.6	115.1	408.7	196.9	603.9	21.9
36793	Microwave components and devices	139	16.6	456.4	10.8	21.7	242.9	779.7	406.7	1 198.8	61.8
36795	Transducers, electrical/electronic input or output, n.e.c.	55	6.9	194.5	3.5	7.1	73.8	345.2	165.0	511.8	23.1
36796	Switches, mechanical, for electronic circuitry	66	11.7	240.1	7.7	14.5	110.4	532.0	319.4	848.9	34.8
36798	Complex components	141	35.9	1 081.8	15.3	28.4	311.5	3 257.7	2 885.8	6 052.0	180.2
36799	Electronic components, n.e.c.	421	49.8	1 121.6	31.7	61.4	518.9	1 932.3	2 542.3	4 329.5	129.8

Note: For qualifications of data, see footnotes on table 1a-1.

Table 5b. Industry-Product Analysis—Value of Shipments and Primary Product Shipments and Specialization and Coverage Ratios for the Industry: 1987 and Earlier Census Years

[An establishment is assigned to an industry based on shipment values of products representing largest amount considered primary to an industry. Frequently, establishment shipments comprise mixtures of products assigned to an industry (primary), those considered primary to other industries (secondary), and receipts for activities such as merchandising or contract work. Columns A-D show this product pattern for an industry, and column E shows primary product specialization ratio. The extent to which an industry's primary products are shipped by establishments classified in and out of an industry is shown in columns F-H and coverage ratio is shown in column I. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendices]

Industry and product group code	Industry and census year	Value of shipments					Value of primary product shipments				
		Total (million dollars)	Primary products (million dollars)	Secondary products (million dollars)	Miscellaneous receipts (million dollars)	Primary product specialization ratio col. B ÷ col. B+C (percent)	Total made in all industries (million dollars)	Made in this industry (million dollars)	Made in other industries (million dollars)	Coverage ratio col. B ÷ col. F (percent)	
3671	Electron tubes	1987--	2 735.4	2 174.4	432.9	128.1	83	2 329.3	2 174.4	154.9	93
3672	Printed circuit boards	1987--	4 672.6	4 413.9	143.6	115.1	97	4 813.9	4 413.9	400.0	92
3674	Semiconductors and related devices	1987--	19 794.9	17 117.5	801.4	1 876.0	96	17 928.8	17 117.5	811.2	95
		1982--	12 429.9	10 782.6	658.6	988.8	94	11 215.4	10 782.6	432.9	96
		1977--	5 322.6	4 262.0	327.7	732.9	93	4 532.3	4 262.0	270.3	94
3675	Electronic capacitors	1987--	1 440.1	1 265.1	97.9	77.2	93	1 307.2	1 265.1	42.1	97
		1982--	1 188.9	1 087.4	70.5	31.0	94	1 207.1	1 087.4	119.7	90
		1977--	742.3	673.1	60.9	8.3	92	736.1	673.1	63.0	91
3678	Electronic resistors	1987--	882.7	809.0	46.6	27.2	95	860.2	809.0	51.2	94
		1982--	765.8	668.0	85.1	12.7	89	758.3	668.0	90.3	88
		1977--	578.3	471.9	70.3	36.1	87	583.0	471.9	111.1	81
3677	Electronic coils and transformers	1987--	1 228.4	1 077.8	123.4	27.3	90	1 184.9	1 077.8	107.1	91
		1982--	863.3	776.3	78.5	8.4	91	924.6	776.3	148.3	84
		1977--	506.4	451.6	47.0	7.8	91	605.8	451.6	154.2	75
3678	Electronic connectors	1987--	4 065.0	3 447.0	522.7	95.3	87	3 731.4	3 447.0	284.4	92
		1982--	2 565.0	2 151.2	323.3	90.5	87	2 353.3	2 151.2	202.1	91
		1977--	1 104.6	844.1	242.0	18.5	78	986.4	844.1	142.3	86
3679	Electronic components, n.e.c.	1987--	15 438.5	12 133.1	2 565.3	740.1	83	14 563.0	12 133.1	2 429.9	83

Table 6a-1. Product and Product Classes—Value of Shipments by All Producers: 1987 and 1982

[Includes value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987		1982	
		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)
3671- --	ELECTRON TUBES, ALL TYPES				
	Total	(NA)	2 329.3	(NA)	(2)
36713 —	Transmitting, industrial, and special purpose electron tubes, except x-ray:				
36713 00	Transmitting, industrial, and special purpose electron tubes, except x-ray (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components)	42	1 114.9	38	962.1
36714 —	Receiving type electron tubes, including cathode ray picture tubes (new and rebuilt):				
36714 00	Receiving type electron tubes, including cathode ray picture tubes (new and rebuilt) (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components)	17	1 012.7	20	873.0
36715 —	Electron tube parts:				
36715 00	Electron tube parts (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components)	33	180.1	(NA)	(2)
36710 —	Electron tubes, n.s.k.	(NA)	21.6	(NA)	19.1
36710 00	Electron tubes, n.s.k., typically for establishments with 20 employees or more (see note)	(NA)	7.8	(NA)	10.3
36710 02	Electron tubes, n.s.k., typically for establishments with less than 20 employees (see note)	(NA)	13.8	(NA)	8.8
3672- --	PRINTED CIRCUIT BOARDS				
	Total	(NA)	4 813.9	(NA)	32 288.9
36720 —	Printed circuit boards:				
36720 00	Printed circuit boards (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components)	716	4 662.1	485	2 288.9
36720 02	Printed circuit boards, n.s.k., typically for establishments with less than 20 employees (see note)	(NA)	151.7	(NA)	(3)
3674- --	SEMICONDUCTORS AND RELATED DEVICES				
	Total	(NA)	17 928.8	(NA)	11 215.4
36741 —	Integrated microcircuits (including semiconductor networks, microprocessors, and MOS memories):				
36741 00	Integrated microcircuits (including semiconductor networks, microprocessors, and MOS memories) (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components)	197	13 300.1	124	7 298.4
36742 —	Transistors:				
36742 00	Transistors (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components)	56	755.6	40	596.1
36743 —	Diodes and rectifiers:				
36743 00	Diodes and rectifiers (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components)	74	692.4	53	506.2
36749 —	Other semiconductor devices (including semiconductor parts, such as wafers and heat sinks):				
36749 00	Other semiconductor devices (including semiconductor parts, such as wafers and heat sinks) (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components)	188	2 586.4	119	2 334.8
36740 —	Semiconductors and related devices, n.s.k.	(NA)	594.2	(NA)	479.9
36740 00	Semiconductors and related devices, n.s.k., typically for establishments with 20 employees or more (see note)	(NA)	384.7	(NA)	364.4
36740 02	Semiconductors and related devices, n.s.k., typically for establishments with less than 20 employees (see note)	(NA)	209.5	(NA)	115.5
3675- --	ELECTRONIC CAPACITORS				
	Total	(NA)	1 307.2	(NA)	1 207.1
36750 —	Capacitors for electronic circuitry:				
36750 00	Capacitors for electronic circuitry (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components)	115	1 293.1	92	1 200.4
36750 02	Capacitors for electronic circuitry, n.s.k., typically for establishments with less than 20 employees (see note)	(NA)	14.1	(NA)	6.7

See footnotes at end of table.

Table 6a-1. Product and Product Classes—Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987		1982	
		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)
3676--	ELECTRONIC RESISTORS				
	Total -----	(NA)	860.2	(NA)	758.3
36760 --	Resistors for electronic circuitry:				
36760 00	Resistors for electronic circuitry (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components) -----	107	851.7	94	756.1
36760 02	Resistors for electronic circuitry, n.s.k., typically for establishments with less than 20 employees (see note) -----	(NA)	8.5	(NA)	2.2
3677--	ELECTRONIC COILS AND TRANSFORMERS				
	Total -----	(NA)	1 184.9	(NA)	924.6
36770 --	Coils, transformers, reactors, and chokes for electronic circuitry:				
36770 00	Coils, transformers, reactors, and chokes for electronic circuitry (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components) -----	(NA)	1 132.9	301	898.1
36770 02	Coils, transformers, reactors, and chokes for electronic circuitry, n.s.k., typically for establishments with less than 20 employees (see note) -----	(NA)	52.0	(NA)	26.5
3678--	CONNECTORS FOR ELECTRONIC CIRCUITRY				
	Total -----	(NA)	3 731.4	(NA)	2 353.3
36781 --	Coaxial (RF) connectors for electronic circuitry:				
36781 00	Coaxial (RF) connectors for electronic circuitry (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components) -----	57	465.0	33	223.3
36782 --	Cylindrical connectors for electronic circuitry:				
36782 00	Cylindrical connectors for electronic circuitry (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components) -----	37	579.3	31	411.7
36783 --	Rack and panel (rectangular) connectors for electronic circuitry:				
36783 00	Rack and panel (rectangular) connectors for electronic circuitry (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components) -----	39	493.4	28	401.2
36784 --	Printed circuit connectors for electronic circuitry:				
36784 00	Printed circuit connectors for electronic circuitry (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components) -----	79	1 024.9	47	464.0
36785 --	Other connectors for electronic circuitry, including parts:				
36785 00	Other connectors for electronic circuitry, including parts (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components) -----	91	1 057.7	77	740.0
36780 --	Connectors for electronic circuitry, n.s.k.				
36780 00	Connectors for electronic circuitry, n.s.k., typically for establishments with 20 employees or more (see note) -----	(NA)	111.2	(NA)	113.1
36780 02	Connectors for electronic circuitry, n.s.k., typically for establishments with less than 20 employees (see note) -----	(NA)	49.7	(NA)	101.2
		(NA)	61.5	(NA)	11.9
3679--	ELECTRONIC COMPONENTS, N.E.C.				
	Total -----	(NA)	14 563.0	(NA)	(4)
36791 --	Crystals, filters, piezoelectric, and other related devices:				
36791 00	Crystals, filters, piezoelectric, and other related devices (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components) -----	117	623.5	98	429.8
36793 --	Microwave components and devices, except antenna, tubes, and semiconductors:				
36793 00	Microwave components and devices, except antenna, tubes, and semiconductors (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components) -----	158	1 188.6	100	794.5
36795 --	Transducers, electrical/electronic input or output, n.e.c.:				
36795 00	Transducers, electrical/electronic input or output, n.e.c. (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components) -----	104	612.9	77	357.0
36796 --	Switches, mechanical, for electronic circuitry:				
36796 00	Switches, mechanical, for electronic circuitry (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components) -----	92	745.9	60	468.8
36798 --	Complex components:				
36798 00	Complex components (two components or more packaged and shipped as a single unit) (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components) -----	206	5 538.8	118	2 655.9

See footnotes at end of table.

Table 6a-1. Product and Product Classes—Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987		1982	
		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)
36799 --	ELECTRONIC COMPONENTS, N.E.C.—Con.				
36799 30	Other electronic components, n.e.c. ----- Earphones and headsets (except telephone), phonograph cartridges and pickups, phonograph needles, and stylus (for additional detail, see Current Industrial Report MA-36M, Radio and Television Receivers, Phonographs, and Related Equipment) -----	(NA)	4 261.7	(NA)	(5)
36799 20	Other electronic components, n.e.c. (including magnetic recording and reproducing heads; static power supply converters for electronic applications, sold separately; electronic cable harness assemblies; liquid crystal displays and magnetic cores, excluding electron tube parts (for additional detail, see Current Industrial Report MA-36Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components) -----	13	45.5	(NA)	(5)
36799 00	Other electronic components, n.e.c., n.s.k. -----	488 (NA)	4 061.4 154.8	(NA)	(4)
36790 00	Electronic components, n.e.c., n.s.k., typically for establishments with 20 employees or more (see note) -----	(NA)	1 591.6	(NA)	(4)
36790 02	Electronic components, n.e.c., n.s.k., typically for establishments with less than 20 employees (see note) -----	(NA)	1 172.8	(NA)	(4)
		(NA)	418.7	(NA)	(4)

Note: In 1982 Census of Manufactures, data for establishments of small single-unit companies with up to 20 employees were estimated from administrative-record data rather than data actually collected from respondents. Employment cutoff used for administrative records for each industry and shipments figures are included in code ending with "002". In both 1982 and 1977 Censuses of Manufactures, products not completely identified on standard forms were coded in appropriate product class (five-digit) followed by "00" or to appropriate product group code (four-digit) followed by "000".

¹Data reported by all producers, not just those with shipments of \$100,000 or more.

²Due to changes made in the 1987 Standard Industrial Classification, data for 1982 are not available. Electron tube parts were reclassified from product code 36799 00 to new product code 36715 00.

³Due to changes made in the 1987 Standard Industrial Classification, data for 1982 are not available. Printed circuit boards were reclassified from old product code 36797 00 to new product code 36720 00. Data for total are approximately 3% understated because administrative record data are not available.

⁴Due to changes made in the 1987 Standard Industrial Classification, data for 1982 are not available. Electron tube parts, magnetic and optical recording media, electronic relays, and printed circuit boards were reclassified in 1987. For a more detail explanation of the Standard Industrial Classification revision, see the final industry series text that supersedes this report.

⁵In 1982, other electronic components included electron tube parts, which were moved to new product code 36715 00 in 1987.

Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MA36M, RADIO AND TELEVISION RECEIVING, PHONOGRAPHS, AND RELATED EQUIPMENT				
36799 01	Earphones and headsets, except telephone -----	(X)	36.3	(X)	24.2
36799 03	Phonograph cartridges and pickups -----	(X)	3.8	(X)	20.9
36799 05	Phonograph needles and stylus -----	(X)	3.1	(X)	15.1
	MA36Q, SEMICONDUCTORS, PRINTED CIRCUIT BOARDS, AND OTHER ELECTRONIC COMPONENTS				
36713 --	Transmittal, industrial, and special purpose electron tubes (except X-ray) -----	(X)	1 139.2	(X)	963.9
	Power and special purpose tubes:				
36713 12	High vacuum tubes:				
36713 17	Triodes and multigrid external anodes ----- thousands	621.0	94.7	690.0	84.8
	Other, including diodes, triodes, and multigrid internal anodes ----- do			263.2	28.4
36713 23	Gas and vapor tubes:				
36713 26	Thyatron, including hydrogen ----- thousands	58.0	11.7	(S)	16.3
	Other gas and vapor tubes ----- do	222.0	40.5	(S)	25.6
36713 31	Klystrons:				
36713 36	Amplifier ----- thousands	7 724.0	80.2	(S)	109.3
36713 41	Reflex ----- do				
	Other klystrons ----- do				
36713 45	Magnetrons:				
36713 50	Pulsed, fixed and tunable ----- thousands	25.0	42.3	32.7	56.8
	Other, including cross-field and CW ----- do	1 535.0	38.3	(S)	30.8
	Traveling wave tubes:				
	Forward wave:				
36713 55	CW:				
	Less than and including 10 watts CW power output rating ----- thousands	5 937.0	33.8	(S)	48.8
36713 61	More than 10 watts CW power output rating ----- do	14 860.0	149.7	(S)	95.7
	Pulsed power:				
36713 65	Less than and including 1 kW peak power output rating ----- thousands	11 296.0	177.7	(S)	9.8
36713 66	More than 1 kW peak power output rating ----- do	2 693.0	10.8	(S)	79.8
36713 92	Backward wave ----- do				19.1

See footnotes at end of table.

Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MA36Q, SEMICONDUCTORS, PRINTED CIRCUIT BOARDS, AND OTHER ELECTRONIC COMPONENTS—Con.				
36713 —	Transmittal, industrial, and special purpose electron tubes (except X-ray)—Con.				
36713 70	Power and special purpose tubes—Con.				
	Light sensing tubes:				
	Camera tubes, photo emissive, and photo conductive—thousands—	43.0	25.4	(S)	38.0
36713 73	Image intensifiers and converters—do—	18 405.0	94.8	(S)	58.7
36713 76	Photo multipliers and other—do—	584.0	8.7	(S)	22.1
	Light emitting devices:				
	Storage tubes:				
36713 79	Electrical readout, all sizes—thousands—	(D)	(D)	6.9	20.9
36713 82	Direct view, all sizes—do—	(D)	(D)		
36713 85	CRT's, industrial and military—do—	77.0	56.6	122.4	60.8
	Special display devices (including alphanumeric readout tubes):				
36713 88	Figure indicating tubes—thousands—	1 504.0	79.4	(NA)	(I)
36713 91	Other—do—				
36713 96	Miscellaneous special purpose tubes, including reference cavities, radiation detection (geiger, neutron counters, etc.), beam deflection, decade counters, orbital beam, vacuum gauges, vacuum capacitors, switches, etc.—	(X)	156.1	(X)	1158.4
36714 —	Receiving type electron tubes, including cathode ray picture tubes (new and rebuilt)	(X)	1 004.7	(X)	873.0
36714 01	Receiving type electron tubes, all types—millions—	13.7	43.8	19.4	42.7
	Cathode ray picture tubes:				
	Television tubes, including any defective tube that has been repaired or rebuilt:				
36714 17	Black and white, new—millions—	(D)	(D)	.8	26.8
36714 18	Black and white, rebuilt—do—				
	Color, new:				
36714 21	17 inch or less—millions—	4.4	295.1	1.4	86.7
36714 23	18 inch and 19 inch—do—	7.4	647.0	5.1	396.9
36714 25	20 inch or more—do—	(D)	(D)	2.8	283.0
36714 26	Color, rebuilt—do—			1.4	36.8
36715 —	Electron tube parts, except glass blanks, including bases, getters, cathodes, headers, guns, etc.	(X)	169.4	(X)	100.3
36720 —	Printed-circuit (wiring) boards, printed cables, and forms already etched, plated, etc., and ready for component insertion	(X)	4 508.5	(X)	2 146.5
36720 12	Single-sided glass printed	(X)	172.5		
36720 14	Double-sided glass printed	(X)	1 099.7		
36720 16	Multilayer glass printed	(X)	1 616.0		
36720 18	Paper/mat/composite printed	(X)	78.0	(X)	2 146.5
36720 22	Flexible circuit printed	(X)	251.6		
36720 24	Other rigid laminates	(X)	885.3		
36720 26	Receipts for contract work on printed circuit boards	(X)	405.4		
36741 —	Integrated microcircuit packages	(X)	12 850.8	(X)	7 321.7
36741 10	Hybrid integrated circuits, thick film composed of material deposited by silk screen process on a passive substrate combined with discrete active or passive components	(X)	800.3	(X)	434.7
36741 11	Hybrid integrated circuits, thin film composed of material deposited by vacuum deposition, sputtering or similar process on a passive substrate combined with discrete active or passive components	(X)	489.8	(X)	215.8
36741 12	Hybrid integrated circuits, multichip circuits not incorporating film techniques. These are usually combinations of chip, active and/or passive; discrete package devices may be used for some but not all circuits	(X)	91.8	(X)	204.0
	Monolithic integrated circuits:				
	Bipolar:				
36741 16	Logic/microprocessors:				
	TTL (transistor-transistor logic), excluding microprocessors—millions—	3 958	1 783.3	(NA)	1 123.8
36741 17	CML/ECL (current mode logic/emitter coupled logic), excluding microprocessors—do—	254.3	404.3	(NA)	190.3
36741 22	I ² L (integrated injector logic), excluding microprocessors—do—	10.8	51.7	(NA)	59.7
36741 23	Linear bipolar, excluding microprocessors—do—	1 078.1	1 454.3	(NA)	(2)
36741 24	Microprocessors—do—	12.5	47.6	(NA)	320.3
36741 25	Other bipolar logic—do—	98.2	350.4	(NA)	2449.6
	Memory:				
36741 27	Random access memories—millions—	57.0	152.3	(NA)	(2)
36741 29	Read only memories—do—			(NA)	(2)
36741 33	Other bipolar memories—do—	8.0	114.5	(NA)	(2)
36741 35	Other bipolar integrated circuits—thousands—	409.8	538.1	(NA)	(2)
	Metal oxide semiconductor (MOS):				
36741 37	Logic/microprocessors:				
	MOS linear ICs, excluding microprocessors and microcontrollers—millions—	420.7	480.0	(NA)	(3)
36741 39	Microprocessors, 4-bit—do—	105.5	365.4	(NA)	(3)
36741 40	Microprocessors, 8-bit—do—				
36741 41	Microprocessors, 16-bit—do—				
36741 42	Microprocessors, 32-bit—do—	27.0	913.4	(NA)	(3)
36741 43	Microcontrollers, 4-bit—do—	68.4	341.8	(NA)	(3)
36741 44	Microcontrollers, 8-bit—do—				
36741 45	Microcontrollers, 16-bit—do—				
36741 47	Other MOS microprocessors—do—	23.8	297.4	(NA)	(3)
36741 48	Other MOS microcontrollers—do—	20.4	157.8	(NA)	3507.6

See footnotes at end of table.

Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MA36Q, SEMICONDUCTORS, PRINTED CIRCUIT BOARDS, AND OTHER ELECTRONIC COMPONENTS—Con.				
36741 —	Integrated microcircuit packages—Con.				
	Monolithic integrated circuits—Con.				
	Metal oxide semiconductor (MOS)—Con.				
	Memory:				
	MOS memories, dynamic random access, (DRAMs):				
36741 50	DRAMs, less than 9,000 bits—millions	7.1	14.9	(NA)	(4)
36741 51	DRAMs, 9,000 through 19,999 bits—do				
36741 52	DRAMs, 20,000 through 39,999 bits—do	23.3	74.5	(NA)	(4)
36741 53	DRAMs, 40,000 through 79,999 bits—do				
36741 54	DRAMs, 80,000 through 300,000 bits—do	110.4	490.3		
36741 55	DRAMs, more than 300,000 bits—do	16.6	373.3		
	MOS memories, static random access, (SRAMs):				
36741 56	SRAMs, less than 9,000 bits—millions	41.6	188.4		
36741 57	SRAMs, 9,000 through 19,999 bits—do	20.2	113.0		
36741 58	SRAMs, 20,000 through 80,000 bits—do	23.4	55.4	(NA)	(4)
36741 59	SRAMs, more than 80,000 bits—do	8.1	40.2		
	MOS memories, read only (Mask):				
36741 61	MOS ROMs (Mask), less than 20,000 bits—millions	5.9	25.5		
36741 62	MOS ROMs (Mask), 20,000 through 39,999 bits—do	2.1	2.8		
36741 63	MOS ROMs (Mask), 40,000 through 79,999 bits—do	4.7	10.2		
36741 64	MOS ROMs (Mask), 80,000 through 199,999 bits—do				
36741 65	MOS ROMs (Mask), 200,000 through 400,000 bits—do	13.2	25.4	(NA)	(4)
36741 66	MOS ROMs (Mask), more than 400,000 bits—do				
	MOS memories, erasable programmable ROMs, (EPROMs):				
36741 67	MOS EPROMs, less than 20,000 bits—millions	11.3	62.5		
36741 68	MOS EPROMs, 20,000 through 39,999 bits—do	16.6	95.4		
36741 69	MOS EPROMs, 40,000 through 79,999 bits—do	25.8	82.0		
36741 70	MOS EPROMs, 80,000 through 199,999 bits—do	21.2	79.1		
36741 71	MOS EPROMs, 200,000 through 400,000 bits—do	35.6	161.5		
36741 72	MOS EPROMs, more than 400,000 bits—do	11.5	104.3	(NA)	(4)
	MOS memories, electrically erasable programmable ROMs, (EEPROMs):				
36741 74	MOS EEPROMs, less than 20,000 bits—millions	21.1	85.3		
36741 75	MOS EEPROMs, 20,000 through 79,999 bits—do	9.1	92.3		
36741 76	MOS EEPROMs, 80,000 through 200,000 bits—do	—			
36741 77	MOS EEPROMs, more than 200,000 bits—do	.2	24.4		
36741 79	Other MOS memories—do	515.3	1 333.2	(NA)	41 959.9
36741 89	Other MOS integrated circuits—do			(NA)	1 091.6
36741 99	Other monolithic integrated circuits—do	56.5	482.4	(NA)	764.3
36742 —	Transistors—	(X)	753.1	(X)	596.8
36742 63	Signal (less than 1 watt dissipation) —	(X)	294.7	(X)	250.6
36742 64	Power (1 watt or more dissipation) —	(X)	458.4	(X)	346.2
36743 —	Diodes and rectifiers— millions	1 910.0	733.5	(NA)	493.5
36743 22	Signal diodes and assemblies thereof (maximum current 0.5 amps)—do	145.0	110.8	(S)	100.1
36743 42	Semiconductor rectifiers/power diodes and assemblies thereof (current rating more than 0.5 amps)—do	783.4	344.7	655.0	212.3
36743 94	Zener diodes (voltage regulator and voltage reference diodes)—do	895.5	141.1	482.0	97.6
36743 12	Selenium rectifiers—do	2.9	3.9	2.0	3.0
36743 83	Microwave diodes (mixers, detectors, varactors, parametric, harmonic generators, etc.)—do	83.2	133.1	55.1	80.5
36749 —	Other semiconductor devices—	(X)	2 482.1	(X)	2 316.7
36749 12	Light-sensitive and light-emitting devices:				
	Solar cells—	(X)	48.1	(X)	46.3
	Light-emitting diodes (LED):				
36749 14	Discrete, infrared and laser—	(X)	27.8	(X)	
36749 16	Alpha or numeric displays—	(X)	18.6		161.6
36749 22	Photodiodes, including infrared detectors—	(X)	26.8		
36749 24	Optical coupled isolators, including sensors and emitters—				
36749 29	Other light-sensitive and light-emitting devices, including photovoltaic devices and photoelectric-magnetic devices—	(X)	47.9	(X)	117.5
	Other semiconductor devices:				
36749 85	Thyristors (SCR's, triacs, PNPN diodes)—	(X)	108.9	(X)	87.0
36749 86	Hall effect devices—	(X)		(X)	(5)
36749 87	All other semiconductor devices, including tunnel diodes, thermoelectric semiconductor junctions, metal-oxide varistors, solid-state transducers, and special semiconductor devices, n.e.c.—	(X)	479.0	(X)	5170.3
	Semiconductor parts:				
36749 94	Chips and wafers:				
36749 95	For integrated circuits (IC's)—	(X)	1 039.4	(X)	
36749 96	For discrete semiconductors—	(X)	150.3		1 390.4
36749 97	All other semiconductor parts (headers, packages, heat sinks, and other accessories)—	(X)	436.1	(X)	343.7
36750 --	Capacitors— millions	11 603.4	1 304.2	(NA)	1 209.2
	Fixed:				
	Paper, plastics (film), metallized, and dual (film/paper) dielectric:				
	Ac types:				
36750 13	Less than 300 volts ac—millions	13.2	27.9		
36750 16	300 volts to 599 volts ac—do	57.9	120.8		
36750 17	600 volts to 999 volts ac—do	7.4	12.4	24.0	
36750 18	1,000 volts or more ac—do	5.4	18.7		83.1
	Dc types/other:				
36750 19	Axial leads—millions	159.9	82.6	(6)	(6)
36750 21	Radial leads—do	226.4	47.5	6411.5	6171.1
36750 24	Chips and other leaded devices—do				

See footnotes at end of table

Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MA36Q, SEMICONDUCTORS, PRINTED CIRCUIT BOARDS, AND OTHER ELECTRONIC COMPONENTS—Con.				
36750 --	Capacitors—Con. Fixed—Con.				
	Tantalum electrolytic: Metal case (including foil and wet) millions	82.1	75.0		
36750 26	do	276.0	45.2	834.8	241.0
36750 28	do	47.7	31.7		
36750 31	do	310.0	72.8		
36750 33	do				
	Aluminum electrolytic: 18 mm diameter or less millions	183.2	64.0	(?)	(?)
36750 36	do	1.2	4.0	(?)	(?)
36750 37	do	5.0	23.1	(?)	(?)
36750 41	do	15.7	23.0	7118.3	7152.7
36750 43	do				
36750 45	do				
	Ceramic dielectric, single layer: Axial millions	149.9	6.1	(?)	(?)
36750 47	do	946.1	39.3	(?)	(?)
36750 49	do				
36750 51	do				
	Ceramic dielectric, multilayer: Axial leads millions	4 241.9	225.6	(?)	(?)
36750 53	do	4 393.3	175.5	85 106.9	8388.1
36750 55	do				
36750 57	do				
	Other: Mica dielectric millions	75.7	24.8	62.8	28.8
36750 59	All other fixed do	374.7	95.4	89.8	7.0
36750 61					
	Variable: Mica, ceramic or glass dielectric millions	17.6	21.6	24.8	15.5
36750 63	do	13.2	29.3	14.7	21.9
36750 69					
36750 75	Parts of capacitors (including unfinished chips for further finishing and assembly) —	(X)	37.8	(X)	(NA)
36760 —	Resistors millions	3 490.4	848.8	(NA)	725.0
	Fixed carbon resistors, composition or film types: Surface mounted (SMD), having two terminals, cylindrical leadless millions				
36760 10	do	82.8	82.5	(S)	78.6
36760 12	Resistors, having two leads: Carbon composition millions				
36760 14	do				
	Other fixed resistors (power capacity 20 W or less): Surface mounted (SMD), having two terminals: Flat resistor chips millions				
36760 24	do	274.3	61.8	(NA)	(NA)
36760 25	Cylindrical leadless resistors (including metal film, metal oxide, and thick cermet film) do			(NA)	(NA)
	Surface mounted (SMD), having more than two terminals: Dual-in-line package millions	68.8	30.5	(NA)	(NA)
36760 28	do			(NA)	(NA)
36760 32	Other (including flat packs) do			(NA)	(NA)
	Resistors, having two leads: Wirewound millions	268.2	74.5	246.1	97.3
36760 34	do				
36760 36	Other (including metal film, metal oxide, and thick cermet film) do	1 986.4	93.7	(NA)	(NA)
	Resistor networks, having more than two leads: Single-in-line millions	255.4	61.5		
36760 38	do				
36760 42	Dual-in-line millions	92.4	46.3	384.9	128.7
36760 44	do	106.3	46.0		
	Variable nonwirewound: Trimmers: Single-turn, carbon and other film millions	99.4	50.3	(?)	(?)
36760 51	do				
36760 54	Multiturn, carbon and other film do	53.8	41.9	8109.4	878.9
36760 58					
36760 62	Potentiometers do	21.2	53.4	(NA)	(NA)
	Variable, wirewound: Nonprecision, single turn (wiper or shaft traverses 360 degrees or less) millions	5.0	36.6	12.7	15.9
36760 65					
	Trimmers: Single-turn millions				
36760 67	do				
36760 69	Multiturn, square and round do	26.4	36.1	8.0	18.9
36760 71	do				
36760 73	Multiturn, rectangular do	6.7	39.9	(NA)	(NA)
	Potentiometers do				
	Miscellaneous: Varistors millions	42.3	5.6	74.7	48.2
36760 75	do				
36760 77	Thermistors, bead type, disk, rod do	101.0	66.1	(X)	(NA)
36760 79	Parts for resistors	(X)	22.2		
36770 --	Coils, transformers, reactors, and chokes for electronic applications	(X)	1 148.9	(X)	842.1
36770 32	Audio transformers millions	34.3	166.7	37.5	130.9
36770 33	Low frequency chokes do	7.4	33.9	9.6	26.2
36770 41	Plate and filament transformers (including auto-transformers, except toroidal) do	24.2	188.4	18.4	187.1
36770 61	Pulse transformers, computer, and other types do	42.9	160.4	23.4	98.5
36770 12	RF chokes do	157.1	49.7	108.0	32.2
36770 13	RF coils do	72.1	50.9	62.2	38.4
36770 14	IF transformers do	3.7	14.2	14.7	19.9
36770 71	Television transformers and reactors (horizontal output, vertical deflection, focus coils, deflection yokes, etc.) do	5.8	35.6	4.6	35.1
36770 91	Toroidal windings (transformers and reactors), except complete magnetic do	22.7	102.1	21.0	81.0
36770 92	Other (balun coils, permeability tuning devices, etc.) do	(X)	347.0	(X)	192.7
36781 --	Coaxial (RF) connectors millions	431.5	470.4	351.6	214.4
36781 21	Miniature (BNC, PNC, MHB) do	58.9	152.2	(10)	(10)
36781 22	Subminiature (SMA, SMB, SMC) do	165.6	123.2	140.3	70.8
36781 24	Other standard and precision do	206.9	195.0	10211.3	10143.6
36782 --	Cylindrical connectors millions	126.3	573.5	142.6	387.8
36782 25	Heavy duty and standard do	44.2	230.5	25.5	134.3
36782 29	Miniature do	42.9	189.8	23.3	157.7
36782 31	Subminiature do	39.2	153.2	93.7	95.7

See footnotes at end of table.

Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
MA36Q, SEMICONDUCTORS, PRINTED CIRCUIT BOARDS, AND OTHER ELECTRONIC COMPONENTS—Con.					
36783 —	Rack and panel (rectangular) connectors ----- millions	801.0	499.8		
36783 35	Integral shell, Mil-C-22857 (8434) and similar types ----- do	416.0	195.2	(NA) 513.9	395.2 167.2
36783 42	Subminiature:				
36783 44	Ribbon (including planar cable type) ----- millions	140.5	94.2		
36783 46	D-subminiature (including planar cable type) ----- do	243.5	197.8	513.1	218.0
	Microminiatures ----- do	1.0	12.6		
38784 —	Printed circuit connectors ----- millions	4 037.0	998.2	2 296.5	444.4
36784 44	Card insertion types ----- do	1 268.7	410.1	943.2	241.2
36784 48	Two-piece types:				
36784 49	Post, header and receptacle type ----- millions	2 693.9	468.8	1 353.3	203.2
	Other two-piece types ----- do	74.3	119.3		
38785 —	Other connectors, including parts -----	(X)	1 087.2	(X)	716.6
36785 41	Hermetic sealed (except single-contact and coaxial types) ----- millions	18.6	174.5	8.2	90.0
36785 51	Plate module types ----- do	7.8	28.1	14.4	25.4
36785 53	Fiber optic connectors ----- do	.3	8.1	(S)	(11)
36785 59	Other planar cable (flat conductor or ribbon cable) (excluding rack and panel (rectangular) types) ----- do	2 026.4	229.5	(S)	11208.8
36785 54	Miscellaneous special purpose ----- do	2 299.2	480.8	1 795.4	326.7
36785 56	Parts for connectors (connectors shipped but still requiring further manufacture) -----	(X)	166.2	(X)	65.7
36791 —	Filters, except microwave and piezoelectric devices -----	(X)	627.2	(X)	408.4
36791 11	Filters, except microwave:				
	Mechanical, excluding optical lenses (germanium silicon, fused quartz, rock salt, and other) ----- thousands	59.0	13.2	55.0	14.2
	RFI/EMI control filters:				
36791 13	Ceramic dielectric ----- thousands	9 395.0	48.7		
36791 15	Combination or other dielectric ----- do	15 612.0	113.3	9 304.0	96.6
36791 21	Electronic wave filters (LC band and high pass) ----- do	710.0	57.3	405.0	31.5
36791 31	Piezoelectric devices:				
36791 33	Oscillator crystals:				
	AT-cut ----- thousands	11 623.0	70.6	16 865.0	69.9
	Other ----- do	11 792.0	34.7	11 446.0	25.4
36791 35	Crystal oscillators:				
36791 37	Oven ----- thousands	106.0	46.5	26.0	10.7
38791 39	TCXO/VCXO ----- do	1 656.0	33.9	70.0	8.1
36791 41	Hybrid ----- do	15 748.0	74.3	3 011.0	88.0
	Other ----- do	1 172.0	31.6		
36791 43	Crystal filters:				
	Monolithic (include filter crystals and/or monolithic filter units not assembled into filters) ----- thousands	4 712.0	20.6	2 883.0	23.7
36791 45	Packaged AT-cut (packaged including monolithic, tandem monolithic, and resonator filter assemblies) ----- do	267.0	12.2	633.0	11.9
36791 47	Other ----- do	675.0	35.8	117.0	11.6
36791 51	Crystal blanks:				
36791 55	AT-cut ----- thousands	4 144.0	11.8	17 053.0	16.9
	Other ----- do	7 762.0	22.8		
36793 —	Microwave components and devices, except antennae, tubes, and semiconductors -----	(X)	1 256.9	(X)	766.4
36793 11	Ferrite (including yttrium garnets) microwave components (circulators, all types; isolators; phase shifters; attenuators; equalizers; limiters; and mixers) -----	(X)	293.3	(X)	119.8
36793 21	Microwave devices, other than ferrite and solid state:				
	Attenuators, dummy loads, high- and low-power terminations, etc. -----	(X)	119.7	(X)	61.6
38793 23	Cavities, including amplifier cavities and coaxial tuned cavities -----	(X)	37.1	(X)	13.2
36793 25	Couplers (directional couplers, hybrid junctions, etc.) -----	(X)	54.4	(X)	50.1
36793 27	Reactive microwave components, n.e.c. -----	(X)	134.5	(X)	53.1
36793 29	Switches, coaxial and waveguide -----	(X)	63.4	(X)	36.1
36793 31	Rigid waveguide and fittings, including bend and twists, couplings, flanges, other simple waveguide n.e.c. -----	(X)	69.5	(X)	87.5
36793 33	Flexible waveguides and fittings -----	(X)	47.0	(X)	30.8
36793 51	Other microwave components, including coaxial to waveguide and other transitions, duplexers and diplexers, holders and mounts, linear and circular polarizers, magnetron test plumbing, rotary joints and sector scan joints, mixer arrays, shutters, tuners, and windows -----	(X)			
36793 71	Microwave subassemblies, including parametric amplifiers and other solid-state assemblies -----	(X)	251.0	(X)	101.7
		(X)	186.9	(X)	212.6
36795 —	Transducers, electrical/electronic input or output, n.e.c. -----	(X)	628.2	(X)	363.1
36795 11	Acoustical, including sonar, ultrasonic, and vibration ----- millions	47.3	161.3	12.3	105.5
	Mechanical:				
36795 21	Accelerometers ----- thousands	109.0	116.7	76.0	65.3
36795 23	Pressure ----- do	521.0	191.0	321.0	77.2
38795 25	Strain gauges and other mechanical ----- do	298.0	70.3	180.0	46.7
36795 31	Thermal, including pyrometers and thermocouples ----- do	422.0	9.6		
38795 96	Other, including optical, chemical, magnetic, and nuclear ----- do	1 425.0	79.3	3 356.0	68.4
36796 —	Switches, mechanical types for electronic circuitry -----	(X)	691.8	(X)	446.1
36796 11	Toggle, including miniature and subminiature -----	(X)	93.9	(X)	89.0
36796 15	Slide, including rocker, miniature and subminiature -----	(X)	75.9	(X)	58.5
36796 19	Rotary selector, including lever and jog-lever, miniature and subminiature -----	(X)	77.0	(X)	72.5
36796 21	Keyboard -----	(X)	45.9	(X)	22.0
36796 25	Pushbutton -----	(X)	92.6	(X)	38.5
36796 29	Snap-action -----	(X)	11.8		
36796 31	Thumbwheel -----	(X)	42.0	(X)	30.7
36796 98	Other switches, n.e.c. (including DIP) -----	(X)	252.9	(X)	134.9

See footnotes at end of table.

Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MA36Q, SEMICONDUCTORS, PRINTED CIRCUIT BOARDS, AND OTHER ELECTRONIC COMPONENTS—Con.				
36798 —	Complex components (two components or more packaged and shipped as a single unit) except filters and other items listed elsewhere	(X)	15 468.4	(X)	2 502.0
36798 21	Passive component packages or modules assembled from discrete components (RC networks, tone control packages, interstate coupling packages, etc.)	(X)	66.4	(X)	16.7
36798 53	Active component packages or modules assembled from specially designed, discrete, miniature components designed only for use in modules or assembled from conventional components, including conventional computer cards, welded component packages, plug-in oscillators, tinker toy, and similar stacked wafer modules	(X)	13 672.3	(X)	2 219.6
36798 79	Components assemblies of discrete active and/or passive components	(X)	1 729.7	(X)	265.7
36799 20	Other electronic components, n.e.c.	(X)	4 108.4	(X)	3 973.4
36799 21	Antenna systems, except structural towers sold separately:				
36799 07	Home antennae	6.2	50.5	5.4	65.7
36799 08	Auto antennae	10.7	39.0	8.9	42.1
36799 09	Antenna accessories, sold separately, including pedestals, drives, passive reflectors, rotators, and radomes	(X)	60.5	(X)	69.2
36799 11	Delay lines, including distributed constant, lumped constant, magnetro strictive, and ultrasonic	10.7	78.6	8.6	60.0
36799 13	Oscillators, except instrumentation and crystal types	14.6	104.8	(S)	110.
36799 14	Rectifiers, electronic, except solid state	(X)	-	(X)	(D)
36799 15	Variable frequency oscillators and antenna tuner kits to be assembled by purchaser	(X)	(D)	(X)	(NA)
36799 16	Magnetic recording and reproducing heads:				
36799 17	Audio	303.0	15.7		
36799 18	Video	27.0	.3	3 706.0	169.7
36799 19	Digital	25 220.0	268.3		
	Instrumentation	(D)	(D)		
36799 21	Static power supply converters for electronic applications, sold separately:				
36799 23	Regulated	704.9	663.9	(S)	403.9
36799 25	Unregulated	1 381.0	10.1	(NA)	12.2
36799 29	Variable frequency	(X)	149.6	(X)	(D)
	Other (ac, dc, converters and inverters, klystron, vibrators, etc.)	(X)	509.9	(X)	376.1
36799 31	Electronic cable harness assemblies	(X)	(D)	(X)	28.2
36799 33	Cryogenic cooling devices (cryostats, etc.) for infrared detectors, masers	(X)	(D)	(X)	50.3
36799 53	Magnetic bubble memories	(X)	20.1	(X)	82.2
36799 51	Liquid crystal displays and other liquid devices	(X)	69.5	(X)	
36799 55	Magnetic cores	(X)			
36799 41	Ferrite devices other than microwave:				
36799 43	Hard ferrites for permanent magnets	(X)	76.4	(X)	66.5
	Soft ferrites for transformers, inductors, deflection yokes, slugs for television tuners, and fractional hp motors	(X)	-	(X)	-
36799 45	Square-loop ferrites for memory cores for computers	(X)			
	Electronic parts, n.e.c., and specialized electronic hardware:				
36799 61	Sockets for electronic component insertion:				
36799 63	Tube sockets	(X)	.8	(X)	6.8
36799 65	Relay sockets	(X)	1.5	(X)	(12)
36799 66	Discrete semiconductor sockets	(X)	105.8	(X)	1214.6
36799 69	Integrated circuit sockets	(X)		(X)	66.2
	Other sockets, including sockets for crystals and switches, etc.	(X)	26.1	(X)	11.7
36799 71	Enclosures for electronic equipment:				
36799 73	Metal enclosures, assembled (welded, etc.)	(X)	17.9	(X)	21.6
	Metal enclosures, modular assembled, including card insertion, rack and panel, etc.	(X)	42.8	(X)	24.5
36799 79	Other enclosures, n.e.c.	(X)	7.1	(X)	3.7
36799 98	All other electronic parts, n.e.c., and specialized electronic hardware	(X)	1 750.4	(X)	2 064.6

¹For 1982, data for product codes 36713 88, 36713 91, and 36713 96 were combined to avoid disclosing data for individual companies.

²For 1982, data for product codes 36741 23, 36741 27, 36741 29, 36741 33, and 36741 35 were combined with product 36741 25.

³For 1982, data for product codes 36741 37, 36741 39, 36741 40, 36741 41, 36741 42, 36741 43, 36741 44, 36741 45, 36741 47, and 36741 48 were combined to avoid disclosing data for individual companies.

⁴For 1982, data for product codes 36741 50, 36741 51, 36741 52, 36741 53, 36741 54, 36741 55, 36741 56, 36741 57, 36741 58, 36741 59, 36741 61, 36741 62, 36741 63, 36741 64, 36741 65, 36741 66, 36741 67, 36741 68, 36741 69, 36741 70, 36741 71, 36741 72, 36741 74, 36741 75, 36741 76, 36741 77, and 36741 79 were combined to avoid disclosing data for individual companies.

⁵For 1982, data for product code 36749 86 were combined with product 36749 87.

⁶For 1982, data for product codes 36750 19, 36750 21, and 36750 24 were combined to avoid disclosing data for individual companies.

⁷For 1982, data for product codes 36750 36, 36750 37, 36750 41, 36750 43, and 36750 45 were combined to avoid disclosing data for individual companies.

⁸For 1982, data for product codes 36750 47, 36750 49, 36750 51, 36750 53, 36750 55, and 36750 57 were combined to avoid disclosing data for individual companies.

⁹For 1982, data for product codes 36760 51 and 36760 54 were combined with product code 36760 58.

¹⁰For 1982, data for product code 36781 21 were combined with product code 36781 24.

¹¹For 1982, data for product code 36785 53 were combined with product code 36785 54.

¹²For 1982, data for product codes 36799 63 and 36799 65 were combined to avoid disclosing data for individual companies.

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1987 and 1982

[Million dollars. Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by type" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1987. For meaning of abbreviations and symbols, see introductory text. For comparability of product classes and product codes between 1982 and 1987 and explanation of terms, see appendixes.]

Product class and geographic area	1987 value of product shipments	1982 value of product shipments	Product class and geographic area	1987 value of product shipments	1982 value of product shipments
36713, TRANSMITTAL, INDUSTRIAL, AND SPECIAL PURPOSE ELECTRON TUBES, EXCEPT X-RAY			36785, OTHER CONNECTORS FOR ELECTRONIC CIRCUITRY, N.E.C.		
United States -----	1 114.9	962.1	United States -----	1 057.7	740.0
California -----	546.8	407.7	California -----	229.6	212.8
Massachusetts -----	154.3	123.3	Connecticut -----	25.9	35.5
New Jersey -----	29.6	73.8	Illinois -----	64.5	62.4
Pennsylvania -----	79.5	76.6	Massachusetts -----	131.6	95.8
			New Jersey -----	17.6	(NA)
36715, ELECTRON TUBE PARTS			New York -----	65.3	31.4
United States -----	180.1	(NA)	Ohio -----	27.6	4.7
California -----	45.9	(NA)	Pennsylvania -----	143.3	58.8
Massachusetts -----	11.9	(NA)			
New Jersey -----	15.4	(NA)			
36741, INTEGRATED MICROCIRCUITS			36791, CRYSTALS, FILTERS, PIEZOELECTRIC, AND OTHER RELATED DEVICES		
United States -----	13 300.1	7 298.4	United States -----	623.5	429.8
Arizona -----	856.8	457.9	California -----	134.6	75.7
California -----	5 154.3	2 432.0	Florida -----	57.4	15.0
Colorado -----	332.1	(NA)	Illinois -----	150.4	127.7
Illinois -----	15.8	(NA)	Kansas -----	18.8	12.2
Massachusetts -----	569.2	177.2	Maryland -----	17.4	(NA)
New Jersey -----	15.7	72.2	Massachusetts -----	42.1	18.3
New York -----	845.9	(NA)	New Jersey -----	18.3	6.4
Washington -----	94.0	(NA)	New York -----	25.9	28.5
36742, TRANSISTORS			Ohio -----	22.2	20.1
United States -----	755.6	596.1	Pennsylvania -----	72.2	57.0
California -----	204.5	147.8	Texas -----	8.2	4.4
Massachusetts -----	31.6	20.8	Wisconsin -----	8.0	(NA)
New York -----	6.7	5.9			
Pennsylvania -----	47.2	107.1			
36743, DIODES AND RECTIFIERS			36793, MICROWAVE COMPONENTS AND DEVICES		
United States -----	692.4	506.2	United States -----	1 188.6	794.5
California -----	143.3	92.7	California -----	511.0	255.6
Massachusetts -----	154.2	117.9	Florida -----	3.6	(NA)
New Jersey -----	11.4	12.2	Maine -----	12.4	(NA)
New York -----	28.6	14.7	Massachusetts -----	197.6	246.6
36749, SEMICONDUCTOR AND RELATED DEVICES, N.E.C.			New Hampshire -----	36.7	(NA)
United States -----	2 586.4	2 334.8	New Jersey -----	78.7	50.7
California -----	546.7	966.8	New York -----	157.7	77.4
Illinois -----	21.0	4.8	Pennsylvania -----	20.9	(NA)
Maryland -----	19.6	(NA)	Texas -----	23.1	(NA)
Massachusetts -----	99.2	44.0			
New Jersey -----	48.7	35.8			
Ohio -----	82.0	25.7	36795, TRANSDUCERS, ELECTRICAL/ELECTRONIC INPUT OR OUTPUT, N.E.C.		
Pennsylvania -----	88.4	175.8	United States -----	612.9	357.0
Texas -----	183.4	197.3	California -----	163.0	84.2
36781, COAXIAL (RF) CONNECTORS			Massachusetts -----	41.0	9.4
United States -----	465.0	223.3	New Jersey -----	35.4	36.6
California -----	11.9	8.2	New York -----	39.8	30.2
Connecticut -----	75.6	(NA)	Ohio -----	24.9	(NA)
Massachusetts -----	36.2	(NA)	Pennsylvania -----	10.0	13.6
New York -----	104.3	75.0	Washington -----	80.1	(NA)
36782, CYLINDRICAL CONNECTORS					
United States -----	579.3	411.7	36796, SWITCHES, MECHANICAL, FOR ELECTRONIC CIRCUITRY		
California -----	262.3	178.9	United States -----	745.9	468.6
Connecticut -----	10.7	(NA)	California -----	94.2	22.4
			Connecticut -----	89.0	57.1
			Illinois -----	139.2	98.4
			Massachusetts -----	64.9	(NA)
			Minnesota -----	4.6	(NA)
36783, RACK AND PANEL (RECTANGULAR) CONNECTORS			New Jersey -----	9.7	9.2
United States -----	493.4	401.2	New York -----	16.2	(NA)
California -----	124.2	103.7	Pennsylvania -----	37.6	(NA)
Massachusetts -----	17.0	(NA)			
Pennsylvania -----	73.5	(NA)	36798, COMPLEX COMPONENTS		
36784, PRINTED CIRCUIT CONNECTORS			United States -----	5 538.8	2 655.9
United States -----	1 024.9	464.0	Arizona -----	7.5	(NA)
California -----	79.5	66.9	California -----	706.3	307.6
Illinois -----	59.1	(NA)	Connecticut -----	11.2	(NA)
Minnesota -----	14.8	(NA)	Illinois -----	65.3	15.7
New York -----	98.2	10.4	Indiana -----	26.4	(NA)
Pennsylvania -----	412.2	164.8	Michigan -----	142.8	52.5
			Minnesota -----	22.1	(NA)
			New Jersey -----	115.7	2.8
			North Carolina -----	14.2	9.6
			Ohio -----	61.0	(NA)
			Pennsylvania -----	6.3	(NA)
				16.7	23.5

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1987 and 1982—Con.

[Million dollars. Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by type" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1987. For meaning of abbreviations and symbols, see introductory text. For comparability of product classes and product codes between 1982 and 1987 and explanation of terms, see appendixes]

Product class and geographic area	1987 value of product shipments	1982 value of product shipments	Product class and geographic area	1987 value of product shipments	1982 value of product shipments
36799, ELECTRONIC COMPONENTS, N.E.C.			36799, ELECTRONIC COMPONENTS, N.E.C.—Con.		
United States -----	4 261.7	(NA)	Maryland -----	4.2	(NA)
Alabama -----	7.4	(NA)	Massachusetts -----	235.5	(NA)
Arizona -----	66.2	(NA)	Michigan -----	38.4	(NA)
Arkansas -----	12.9	(NA)	Minnesota -----	49.5	(NA)
California -----	997.1	(NA)	Missouri -----	18.9	(NA)
Colorado -----	50.6	(NA)	New Hampshire -----	25.4	(NA)
Connecticut -----	93.7	(NA)	New Jersey -----	254.8	(NA)
Florida -----	77.4	(NA)	New York -----	734.1	(NA)
Illinois -----	82.6	(NA)	Ohio -----	140.8	(NA)
Indiana -----	101.0	(NA)	Oregon -----	28.7	(NA)
Kansas -----	20.2	(NA)	Pennsylvania -----	112.3	(NA)
			Rhode Island -----	23.2	(NA)
			Tennessee -----	22.1	(NA)
			Texas -----	127.8	(NA)
			Utah -----	5.7	(NA)
			Virginia -----	7.1	(NA)
			Washington -----	8.0	(NA)
			Wisconsin -----	63.9	(NA)

Table 6c. Historical Statistics for Product Classes—Value Shipped by All Producers: 1987 and Earlier Years

[Million dollars. For meaning of abbreviations and symbols, see introductory text. For comparability of product classes and product codes between 1982 and 1987 and explanation of terms, see appendixes]

1987 product code	Product class	1987	1986 ¹	1985 ¹	1984 ¹	1983 ¹	1982	1977	1972
3671- 36713	Electron tubes, all types -----	2 329.3	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	Transmittal, industrial, and special purpose electron tubes, except x-ray -----	1 114.9	1 122.3	1 195.4	1 167.8	1 054.6	962.1	544.6	366.2
36714	Receiving type electron tubes, including cathode ray picture tubes -----	0 012.7	975.7	892.1	936.1	994.3	873.0	707.5	823.2
36715	Electron tube parts -----	180.1	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
36710	Electron tubes, n.s.k. -----	21.6	10.7	9.8	18.0	21.4	19.1	17.4	(NA)
3672-	Printed circuit boards -----	4 813.9	23 404.7	23 349.9	23 646.8	22 678.9	22 288.9	(NA)	(NA)
36720	Printed circuit boards -----	4 813.9	23 404.7	23 349.9	23 646.8	22 678.9	22 288.9	(NA)	(NA)
3674-	Semiconductors and related devices -----	17 928.8	14 929.6	15 253.2	17 819.4	12 800.6	11 215.4	4 532.3	2 360.8
36741	Integrated microcircuits -----	13 300.1	10 925.4	10 871.9	13 484.3	8 646.5	7 298.4	2 697.1	1 267.8
36742	Transistors -----	755.6	696.9	681.4	797.4	601.8	596.1	462.6	413.6
36743	Diodes and rectifiers -----	692.4	671.7	700.4	686.1	572.2	506.2	414.9	300.8
36749	Semiconductor and related devices, n.e.c. -----	2 586.4	2 303.2	2 568.6	2 542.9	2 484.3	2 334.8	835.8	337.2
36740	Semiconductors and related devices, n.s.k. -----	594.2	332.4	431.0	308.8	495.7	479.9	122.0	41.4
3675-	Electronic capacitors -----	1 307.2	1 254.2	1 334.7	1 582.7	1 293.3	1 207.1	736.1	454.4
36750	Capacitors for electronic circuitry -----	1 307.2	1 254.2	1 334.7	1 582.7	1 293.3	1 207.1	736.1	454.4
3676-	Electronic resistors -----	860.2	913.4	951.9	942.7	748.4	758.3	583.0	438.1
36760	Resistors for electronic circuitry -----	860.2	913.4	951.9	942.7	748.4	758.3	583.0	438.1
3677-	Electronic coils and transformers -----	1 184.9	1 071.0	1 221.2	1 127.6	1 046.5	924.6	605.8	385.3
36770	Coils, transformers, reactors, and chokes -----	1 184.9	1 071.0	1 221.2	1 127.6	1 046.5	924.6	605.8	385.3
3678-	Connectors for electronic circuitry -----	3 731.4	3 198.8	3 047.0	3 270.0	2 724.4	2 353.3	986.0	523.6
36781	Coaxial (rf) connectors -----	465.0	345.8	332.2	269.6	228.9	223.3		
36782	Cylindrical connectors -----	579.3	502.9	472.4	439.0	425.6	411.7		
36783	Rack and panel (rectangular) connectors -----	493.4	448.7	361.2	470.5	465.8	401.2		
36784	Printed circuit connectors -----	1 024.9	721.6	732.9	690.7	593.1	464.0		
36785	Other connectors for electronic circuitry, n.e.c. -----	1 057.7	1 099.5	1 076.7	1 321.4	881.1	740.0		
36780	Connectors for electronic circuitry, n.s.k. -----	111.2	80.2	71.6	78.9	130.0	113.1		
3679-	Electronic components, n.e.c. -----	14 563.0	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
36791	Crystals, filters, piezoelectric, and other related devices -----	623.5	542.7	520.0	556.5	536.0	429.8	(NA)	(NA)
36793	Microwave components and devices -----	1 188.6	1 105.8	966.1	856.6	773.4	794.5	(NA)	(NA)
36795	Transducers, electrical/electronic input or output, n.e.c. -----	612.9	630.1	572.8	420.0	368.2	357.0	(NA)	(NA)
36796	Switches, mechanical, for electronic circuitry -----	745.9	541.6	601.7	553.0	552.1	468.6	(NA)	(NA)
36798	Complex components -----	5 538.8	3 288.6	3 368.4	3 062.2	2 805.3	2 655.9	(NA)	(NA)
36799	Electronic components, n.e.c. -----	4 261.7	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
36790	Electronic components, n.e.c., n.s.k. -----	1 591.6	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)

¹Figures are estimates derived from a representative sample of manufacturing establishments. Standard errors associated with estimates are published in annual survey of manufactures publications for this period.

²Data are approximately 3% understated because estimates for administrative-record establishments are not available.

Table 7. Materials Consumed by Kind: 1987 and 1982

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendices. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
INDUSTRY 3671, ELECTRON TUBES					
	Materials, parts, containers, and supplies -----	(X)	31 062.5	(X)	(*)
	Mill shapes and forms, except castings:				
331001	Carbon steel ----- 1,000 s tons	(D)	(D)	(NA)	(NA)
331020	Alloy steel, except stainless ----- do	(S)	1.1	(NA)	(NA)
331031	Stainless steel ----- do	(S)	5.4	(NA)	(NA)
	Copper and copper-base alloy:				
335728	Bare wire for electrical conduction only ----- mil lb	(Z)	.1	(NA)	(NA)
335102	Rod, bar, and mechanical wire, including extruded and/or drawn shapes ----- do	*1.4	2.5	(NA)	(NA)
335143	Plate, sheet, and strip, including military cups and discs ----- do	**.5	1.4	(NA)	(NA)
335152	Pipe and tube ----- do	**.3	.9	(NA)	(NA)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb	(D)	(D)	(NA)	(NA)
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do	(D)	(D)	(NA)	(NA)
335008	All other aluminum mill shapes and forms ----- do	(S)	2.0	(NA)	(NA)
335616	Nickel and nickel-base alloy mill shapes and forms ----- do	(D)	(D)	(NA)	(NA)
335691	Tantalum mill products ----- 1,000 lb	(D)	(D)	(NA)	(NA)
335791	Insulated copper wire and cable (except magnet wire) ----- mil lb	(S)	3.0	(NA)	(NA)
335770	Magnet wire ----- do	(D)	(D)	(NA)	(NA)
	Castings (rough and semifinished):				
332012	Iron (gray and malleable) and steel ----- 1,000 s tons	(D)	(D)	(NA)	(NA)
336005	Aluminum and aluminum-base alloy ----- mil lb	(D)	(D)	(NA)	(NA)
336003	Other nonferrous ----- do	(S)	1.3	(NA)	(NA)
339915	Metal powders ----- do	(S)	6.6	(NA)	(NA)
333902	Precious metals, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.), except gold ----- 1,000 troy ounces	(S)	5.1	(NA)	(NA)
333905	Gold, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.) ----- do	12.7	4.9	(NA)	(NA)
362111	Fractional horsepower electric motors less than 1 hp ----- number	(D)	(D)	(NA)	(NA)
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic-type components -----	(X)	57.6	(NA)	(NA)
281995	Silicon, hyperpure ----- kilograms	(S)	.6	(NA)	(NA)
333977	Germanium ----- 1,000 lb	(D)	(D)	(NA)	(NA)
265001	Paperboard containers, boxes, and corrugated paperboard -----	(X)	5.1	(NA)	(NA)
333998	Silicon, unalloyed ----- 1,000 s tons	(D)	(D)	(NA)	(NA)
339913	Ferrites (powder and paste) -----	(X)	(D)	(NA)	(NA)
	Glass and glass products:				
322923	Tube blanks, except color television picture -----	(X)	8.5	(NA)	(NA)
322924	Color television picture tube blanks -----	(X)	353.5	(NA)	(NA)
320311	Other than tube blanks -----	(X)	8.6	(NA)	(NA)
	Bearings, including mounted and unmounted:				
356218	Ball -----	(X)	(D)	(NA)	(NA)
356201	Roller -----	(X)	(Z)	(NA)	(NA)
364300	Current-carrying wiring devices -----	(X)	4.6	(NA)	(NA)
382501	Electrical instrument mechanisms and meter movements, including instrument relays -----	(X)	9.7	(NA)	(NA)
282104	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc., but excluding sheets, rods, tubes, and shapes ----- mil lb	(S)	.8	(NA)	(NA)
344401	Sheet metal products, except stampings -----	(X)	23.9	(NA)	(NA)
345001	Bolts, nuts, screws, washers, rivets, and screw machine products -----	(X)	6.7	(NA)	(NA)
346901	Metal stampings -----	(X)	57.0	(NA)	(NA)
308006	Fabricated plastics products (except gaskets, hose, and belting) -----	(X)	12.6	(NA)	(NA)
365150	Loud speakers, microphones, and tuners (all types) -----	(X)	(D)	(NA)	(NA)
366301	Electronic communication equipment -----	(X)	(D)	(NA)	(NA)
357004	Electronic computing equipment and parts -----	(X)	(D)	(NA)	(NA)
382700	Optical instruments and lenses, except sighting, tracking, and fire control -----	(X)	3.1	(NA)	(NA)
333951	Doped chemicals for electronic use -----	(X)	1.3	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies -----	(X)	269.3	(NA)	(NA)
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	165.3	(NA)	(NA)
INDUSTRY 3672, PRINTED CIRCUIT BOARDS					
	Materials, parts, containers, and supplies -----	(X)	31 813.2	(NA)	(*)
	Mill shapes and forms, except castings:				
331001	Carbon steel ----- 1,000 s tons	(D)	(D)	(NA)	(NA)
331020	Alloy steel, except stainless ----- do	(S)	(Z)	(NA)	(NA)
331031	Stainless steel ----- do	(S)	.3	(NA)	(NA)
	Copper and copper-base alloy:				
335728	Bare wire for electrical conduction only ----- mil lb	(S)	.4	(NA)	(NA)
335102	Rod, bar, and mechanical wire, including extruded and/or drawn shapes ----- do	(S)	3.6	(NA)	(NA)
335143	Plate, sheet, and strip, including military cups and discs ----- do	(S)	73.0	(NA)	(NA)
335152	Pipe and tube ----- do	-	-	(NA)	(NA)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb	(S)	5.9	(NA)	(NA)
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do	(D)	(D)	(NA)	(NA)
335008	All other aluminum mill shapes and forms ----- do	(S)	.2	(NA)	(NA)
335616	Nickel and nickel-base alloy mill shapes and forms ----- do	(D)	(D)	(NA)	(NA)
335691	Tantalum mill products ----- 1,000 lb	(D)	(D)	(NA)	(NA)
335791	Insulated copper wire and cable (except magnet wire) ----- mil lb	(S)	3.1	(NA)	(NA)
335770	Magnet wire ----- do	(S)	(Z)	(NA)	(NA)

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1987 and 1982—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
INDUSTRY 3672, PRINTED CIRCUIT BOARDS—Con.					
332012	Castings (rough and semifinished): Iron (gray and malleable) and steel	1,000 s tons	—	—	(NA)
336005	Aluminum and aluminum-base alloy	mil lb	(D)	(D)	(NA)
336003	Other nonferrous	do	(D)	(D)	(NA)
339915	Metal powders	do	(D)	(D)	(NA)
333902	Precious metals, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.), except gold	1,000 troy ounces	(S)	6.4	(NA)
333905	Gold, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.)	do	(S)	47.1	(NA)
362111	Fractional horsepower electric motors less than 1 hp	number	(S)	.1	(NA)
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic-type components	—	(X)	151.3	(NA)
281995	Silicon, hyperpure	kilograms	(S)	(D)	(NA)
333977	Germanium	1,000 lb	(S)	(Z)	(NA)
265001	Paperboard containers, boxes, and corrugated paperboard	—	(X)	7.4	(NA)
333998	Silicon, unalloyed	1,000 s tons	(S)	(Z)	(NA)
339913	Ferrites (powder and paste)	—	(X)	(D)	(NA)
Glass and glass products:					
322923	Tube blanks, except color television picture	—	(X)	—	(NA)
322924	Color television picture tube blanks	—	(X)	—	(NA)
320311	Other than tube blanks	—	(X)	(Z)	(NA)
Bearings, including mounted and unmounted:					
356218	Ball	—	(X)	.1	(NA)
356201	Roller	—	(X)	—	(NA)
364300	Current-carrying wiring devices	—	(X)	(D)	(NA)
382501	Electrical instrument mechanisms and meter movements, including instruments relays	—	(X)	(D)	(NA)
282104	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc., excluding sheets, rods, tubes, and shapes	mil lb	(D)	(D)	(NA)
344401	Sheet metal products, except stampings	—	(X)	3.6	(NA)
345001	Bolts, nuts, screws, washers, rivets, and screw machine products	—	(X)	6.2	(NA)
346901	Metal stampings	—	(X)	2.2	(NA)
308006	Fabricated plastics products (except gaskets, hose, and belting)	—	(X)	33.7	(NA)
365150	Loud speakers, microphones, and tuners (all types)	—	(X)	(D)	(NA)
366301	Electronic communication equipment	—	(X)	(D)	(NA)
357004	Electronic computing equipment and parts	—	(X)	20.8	(NA)
382700	Optical instruments and lenses, except sighting, tracking, and fire control	—	(X)	(D)	(NA)
333951	Doped chemicals for electronic use	—	(X)	13.7	(NA)
970099	All other materials and components, parts, containers, and supplies	—	(X)	633.7	(NA)
971000	Materials, parts, containers, and supplies, n.s.k. ²	—	(X)	755.8	(NA)
INDUSTRY 3674, SEMICONDUCTORS AND RELATED DEVICES					
Materials, parts, containers, and supplies					
(X)	4 444.9	(X)	2 966.6		
Mill shapes and forms, except castings:					
331001	Carbon steel	1,000 s tons	(D)	(D)	(S)
331020	Alloy steel, except stainless	do	(S)	2.9	(S)
331031	Stainless steel	do	(S)	.2	(S)
335728	Copper and copper-base alloy:	—	(D)	(D)	(S)
335102	Bare wire for electrical conduction only	mil lb	(D)	(D)	(S)
335143	Rod, bar, and mechanical wire, including extruded and/or drawn shapes	do	(S)	3.3	(S)
335152	Plate, sheet, and strip, including military cups and discs	—	(S)	27.3	(S)
335301	Pipe and tube	do	(D)	(D)	(S)
335405	Aluminum and aluminum-base alloy:	—	(D)	(D)	(S)
335405	Sheet, plate, and foil	mil lb	15.7	4.1	*.6
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc.	—	(S)	13.1	.8
335008	All other aluminum mill shapes and forms	—	(S)	.1	*3.8
335616	Nickel and nickel-base alloy mill shapes and forms	—	(S)	.1	*3.1
335691	Tantalum mill products	1,000 lb	(S)	8.9	(S)
335791	Insulated copper wire and cable (except magnet wire)	mil lb	(D)	(D)	(D)
335770	Magnet wire	do	(D)	(D)	(D)
Castings (rough and semifinished):					
332012	Iron (gray and malleable) and steel	1,000 s tons	(S)	(Z)	(S)
336005	Aluminum and aluminum-base alloy	mil lb	(S)	.1	(D)
336003	Other nonferrous	do	(D)	(D)	(D)
339915	Metal powders	do	(D)	(D)	(D)
333902	Precious metals, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.), except gold	1,000 troy ounces	(S)	21.9	*575.1
333905	Gold, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.)	do	*439.2	142.5	132.3
362111	Fractional horsepower electric motors less than 1 hp	number	(S)	(Z)	1.0
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic-type components	—	(X)	832.4	338.4
281995	Silicon, hyperpure	kilograms	(S)	159.9	111.5
333977	Germanium	1,000 lb	(S)	1.1	.8
265001	Paperboard containers, boxes, and corrugated paperboard	—	(X)	6.9	(D)
333998	Silicon, unalloyed	1,000 s tons	(D)	(D)	(D)
339913	Ferrites (powder and paste)	—	(X)	.8	(D)

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1987 and 1982—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
INDUSTRY 3674, SEMICONDUCTORS AND RELATED DEVICES—Con.					
322923	Glass and glass products:				
322924	Tube blanks, except color television picture	(X)	(D)	(X)	1.6
320311	Color television picture tube blanks	(X)	—	(X)	(D)
	Other than tube blanks	(X)	7.1	(X)	6.9
356218	Bearings, including mounted and unmounted:				
356201	Ball	(X)	(D)	(X)	(*)
364300	Roller	(X)	(D)	(X)	(*)
382501	Current-carrying wiring devices	(X)	(D)	(X)	(D)
282104	Electrical instrument mechanisms and meter movements, including instrument relays	(X)	(D)	(X)	5.4
344401	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc., but excluding sheets, rods, tubes, and shapes	(S)	24.9	(S)	29.9
345001	Sheet metal products, except stampings	(X)	1.3	(X)	12.0
	Bolts, nuts, screws, washers, rivets, and screw machine products	(X)	9.8	(X)	8.8
346901	Metal stampings	(X)	42.5	(X)	94.3
308006	Fabricated plastics products (except gaskets, hose, and belting)	(X)	15.5	(X)	11.2
365150	Loud speakers, microphones, and tuners (all types)	(X)	(Z)	(X)	.5
366301	Electronic communication equipment	(X)	(D)	(X)	(D)
357004	Electronic computing equipment and parts	(X)	19.4	(X)	18.1
382700	Optical instruments and lenses, except sighting, tracking, and fire control	(X)	18.5	(X)	(D)
333951	Doped chemicals for electronic use	(X)	43.0	(X)	(*)
970099	All other materials and components, parts, containers, and supplies	(X)	1 052.2	(X)	41 532.2
971000	Materials, parts, containers, and supplies, n.s.x. ²	(X)	1 870.1	(X)	583.1
INDUSTRY 3675, ELECTRONIC CAPACITORS					
	Materials, parts, containers, and supplies	(X)	475.8	(X)	420.7
Mill shapes and forms, except castings:					
331001	Carbon steel	1,000 s tons	(D)	(D)	(D)
331020	Alloy steel, except stainless	do	(S)	(Z)	(D)
331031	Stainless steel	do	(S)	(Z)	(D)
335728	Copper and copper-base alloy:				
335102	Bare wire for electrical conduction only	mil lb	(S)	1.2	(S)
	Rod, bar, and mechanical wire, including extruded and/or drawn shapes	do	(D)	(D)	.6
335143	Plate, sheet, and strip, including military cups and discs	do	(D)	(D)	(D)
335152	Pipe and tube	do	(S)	(Z)	(D)
335901	Aluminum and aluminum-base alloy:				
335405	Sheet, plate, and foil	mil lb	(S)	26.1	(S)
	Extruded shapes, including extruded rod, bar, pipe, tube, etc.	do	(S)	2.0	(S)
335008	All other aluminum mill shapes and forms	do	(S)	.1	(D)
335616	Nickel and nickel-base alloy mill shapes and forms	do	(D)	(D)	(D)
335691	Tantalum mill products	1,000 lb	(D)	(D)	36.1
335791	Insulated copper wire and cable (except magnet wire)	mil lb	(S)	.2	(D)
335770	Magnet wire	do	(D)	.4	(D)
Castings (rough and semifinished):					
332012	Iron (gray and malleable) and steel	1,000 s tons	—	—	—
336005	Aluminum and aluminum-base alloy	mil lb	(D)	(D)	(D)
336003	Other nonferrous	do	(D)	(D)	(D)
339915	Metal powders	do	(S)	17.3	(D)
333902	Precious metals, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.), except gold	1,000 troy ounces			
333905	Gold, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.)	do	(S)	62.4	(S)
362111	Fractional horsepower electric motors less than 1 hp	number	5.1	2.5	(D)
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic-type components	(X)	14.6	(D)	(D)
281995	Silicon, hyperpure	1,000 kilograms	—	—	(D)
333977	Germanium	1,000 lb	—	—	—
265001	Paperboard containers, boxes, and corrugated paperboard	(X)	9.0	(X)	(*)
333998	Silicon, unalloyed	1,000 s tons	—	—	(*)
339913	Ferrites (powder and paste)	(X)	(Z)	(X)	(D)
Glass and glass products:					
322923	Tube blanks, except color television picture	(X)	(Z)	(X)	(D)
322924	Color television picture tube blanks	(X)	—	(X)	—
320311	Other than tube blanks	(X)	(D)	(X)	(D)
282104	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc., but excluding sheets, rods, tubes, and shapes	mil lb	**7.8	4.9	(S)
356218	Bearings, including mounted and unmounted:				
356201	Ball	(X)	(Z)	(X)	(*)
364300	Roller	(X)	(D)	(X)	(*)
382501	Current-carrying wiring devices	(X)	.4	(X)	(D)
344401	Electrical instrument mechanisms and meter movements, including instrument relays	(X)	.2	(X)	(Z)
345001	Sheet metal products, except stampings	(X)	.3	(X)	(D)
	Bolts, nuts, screws, washers, rivets, and screw machine products	(X)	2.7	(X)	5.4
346901	Metal stampings	(X)	2.0	(X)	7.5
308006	Fabricated plastics products (except gaskets, hose, and belting)	(X)	3.9	(X)	2.6

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1987 and 1982—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
INDUSTRY 3675, ELECTRONIC CAPACITORS—Con.					
365150	Loud-speakers, microphones, and tuners (all types)	(X)	-	(X)	-
366301	Electronic communication equipment.....	(X)	-	(X)	-
357004	Electronic computing equipment and parts.....	(X)	(D)	(X)	(D)
382700	Optical instruments and lenses, except sighting, tracking, and fire control	(X)	(Z)	(X)	-
333951	Doped chemicals for electronic use	(X)	.9	(X)	(*)
970099	All other materials and components, parts, containers, and supplies.....	(X)	156.7	(X)	157.7
971000	Materials, parts, containers, and supplies, n.s.k. ²	(X)	157.0	(X)	40.1
INDUSTRY 3676, ELECTRONIC RESISTORS					
Materials, parts, containers, and supplies					
		(X)	237.1	(X)	214.1
Mill shapes and forms, except castings:					
331001	Carbon steel 1,000 s tons	**.1	.2	(S)	.8
331020	Alloy steel, except stainless do	(D)	(D)	(S)	(D)
331031	Stainless steel do	(D)	(D)	(S)	1.4
Copper and copper-base alloy:					
335728	Bare wire for electrical conduction only mil lb	(S)	5.7	(S)	7.8
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes do	(S)	.4	(S)	1.0
335143	Plate, sheet, and strip, including military cups and discs do	**.3	.5	(D)	(D)
335152	Pipe and tube do	-	-	(D)	(D)
Aluminum and aluminum-base alloy:					
335301	Sheet, plate, and foil mil lb	(S)	(Z)		
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. do	(D)	(D)		
335008	All other aluminum mill shapes and forms do	(S)	(Z)		
335616	Nickel and nickel-base alloy mill shapes and forms do	(S)	.7	(S)	.7
335691	Tantalum mill products 1,000 lb	-	-	(D)	(D)
335791	Insulated copper wire and cable (except magnet wire) mil lb	(S)	.5	(S)	1.3
335770	Magnet wire do	(D)	(D)	(D)	(D)
Castings (rough and semifinished):					
332012	Iron (gray and malleable) and steel 1,000 s tons	-	-	(D)	(D)
336005	Aluminum and aluminum-base alloy mil lb	(S)	(Z)	(D)	(D)
336003	Other nonferrous do	(D)	(D)	(S)	.1
339915	Metal powders do	(S)	1.1	(D)	(D)
333902	Precious metals, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.), except gold 1,000 troy ounces				
333905	Gold, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.) do	(S)	11.1	**101.7	13.2
362111	Fractional horsepower electric motors less than 1 hp number	(S)	2.4		
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic-type components	(S)	(Z)	(D)	(D)
281995	Silicon, hyperpure 1,000 kilograms	(X)	20.6	(D)	(D)
333977	Germanium 1,000 lb	-	-	-	-
265001	Paperboard containers, boxes, and corrugated paperboard	(X)	2.2	(X)	(*)
333998	Silicon, unalloyed 1,000 s tons	-	-	(X)	(*)
339913	Ferrites (powder and paste)	(X)	-	(X)	(D)
Glass and glass products:					
322923	Tube blanks, except color television picture	(X)	.2	(X)	(D)
322924	Color television picture tube blanks	(X)		(X)	-
320311	Other than tube blanks	(X)		(X)	(D)
Bearings, including mounted and unmounted:					
356218	Ball (X)	(D)	(X)	(X)	(*)
356201	Roller (X)	(Z)	(X)	(X)	(*)
364300	Current-carrying wiring devices (X)	(D)	(X)	(X)	.4
382501	Electrical instrument mechanisms and meter movements, including instrument relays	(X)	(Z)	(X)	.1
282104	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc., but excluding sheets, rods, tubes, and shapes mil lb	(S)	5.1	(S)	4.2
344401	Sheet metal products, except stampings (X)	(D)	(X)		
345001	Bolts, nuts, screws, washers, rivets, and screw machine products	(X)	4.3	(X)	2.7
346901	Metal stampings	(X)	10.7	(X)	8.7
308006	Fabricated plastics products (except gaskets, hose, and belting)	(X)	9.6	(X)	3.9
365150	Loud speakers, microphones, and tuners (all types)	(X)	-	(X)	-
366301	Electronic communication equipment	(X)	-	(X)	-
357004	Electronic computing equipment and parts	(X)	(D)	(X)	(D)
382700	Optical instruments and lenses, except sighting, tracking, and fire control	(X)	-	(X)	-
333951	Doped chemicals for electronic use	(X)	(D)	(X)	(*)
970099	All other materials and components, parts, containers, and supplies	(X)	55.8	(X)	
971000	Materials, parts, containers, and supplies, n.s.k. ²	(X)	100.7	(X)	25.1

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1987 and 1982—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
INDUSTRY 3677, ELECTRONIC COILS AND TRANSFORMERS					
	Materials, parts, containers, and supplies -----	(X)	438.6	(X)	307.0
	Mill shapes and forms, except castings:				
331001	Carbon steel ----- 1,000 s tons	(S)	7.5	*12.6	22.7
331020	Alloy steel, except stainless ----- do	(S)	8.6	(S)	8.6
331031	Stainless steel ----- do	(S)	.1	(S)	.1
	Copper and copper-base alloy:				
335728	Bare wire for electrical conduction only ----- mil lb	*5.7	11.1	**4.8	9.9
335102	Rod, bar, and mechanical wire, including extruded and/or drawn shapes ----- do	(S)	.9	2.8	3.1
335143	Plate, sheet, and strip, including military cups and discs ----- do	*1.3	2.4	(S)	.4
335152	Pipe and tube ----- do	.3	.4	(S)	.4
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb	(S)	.9	*.7	.9
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do	(S)	.1	(S)	.9
335008	All other aluminum mill shapes and forms ----- do	(S)	1.3		
335616	Nickel and nickel-base alloy mill shapes and forms ----- do	(S)	.9	(Z)	.6
335691	Tantalum mill products ----- 1,000 lb	(D)	(D)	(D)	(D)
335791	Insulated copper wire and cable (except magnet wire) ----- mil lb	(S)	11.0	(S)	8.5
335770	Magnet wire ----- do	(S)	46.0	(S)	24.0
	Castings (rough and semifinished):				
332012	Iron (gray and malleable) and steel ----- 1,000 s tons	(S)	2.1	(D)	(D)
336005	Aluminum and aluminum-base alloy ----- mil lb	*.1	.3	(D)	(D)
336003	Other nonferrous ----- do	(S)	(Z)	(D)	(D)
339915	Metal powders ----- do	(S)	1.1	**.3	.7
333902	Precious metals, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.), except gold ----- 1,000 troy ounces	(S)	1.3	(S)	1.0
333905	Gold, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.) ----- do	(D)	(D)	(D)	(D)
362111	Fractional horsepower electric motors less than 1 hp ----- number	(D)	(D)	(D)	(D)
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic-type components ----- (X)	32.3	(X)	(D)	(D)
281995	Silicon, hyperpure ----- 1,000 kilograms	(S)	(Z)	-	-
333977	Germanium ----- 1,000 lb	(X)	-	-	-
265001	Paperboard containers, boxes, and corrugated paperboard ----- (X)	3.1	(X)	(X)	(*)
333998	Silicon, unalloyed ----- 1,000 s tons	(D)	(D)	(X)	(*)
339913	Ferrites (powder and paste) ----- (X)	8.4	(X)	(X)	5.0
	Glass and glass products:				
322923	Tube blanks, except color television picture ----- (X)	-	(X)	(D)	(D)
322924	Color television picture tube blanks ----- (X)	-	(X)	-	-
320311	Other than tube blanks ----- (X)	(D)	(X)	-	-
	Bearings, including mounted and unmounted:				
356218	Ball ----- (X)	(D)	(X)	(X)	(*)
356201	Roller ----- (X)	(X)	(X)	(X)	(*)
364300	Current-carrying wiring devices ----- (X)	1.3	(X)	1.1	
382501	Electrical instrument mechanisms and meter movements, including instrument relays ----- (X)	.4	(X)	.1	
282104	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc., but excluding sheets, rods, tubes, and shapes ----- mil lb	(S)	4.1	(S)	4.1
344401	Sheet metal products, except stampings ----- (X)	5.4	(X)	2.7	
345001	Bolts, nuts, screws, washers, rivets, and screw machine products ----- (X)	4.2	(X)	3.6	
346901	Metal stampings ----- (X)	20.1	(X)	11.9	
308006	Fabricated plastics products (except gaskets, hose, and belting) ----- (X)	7.2	(X)	3.3	
365150	Loud speakers, microphones, and tuners (all types) ----- (X)	(Z)	(X)	-	
366301	Electronic communication equipment ----- (X)	.1	(X)	(D)	(D)
357004	Electronic computing equipment and parts ----- (X)	(D)	(X)	.2	
382700	Optical instruments and lenses, except sighting, tracking, and fire control ----- (X)	(Z)	(X)	(D)	(D)
333951	Doped chemicals for electronic use ----- (X)	1.1	(X)	(*)	(*)
970099	All other materials and components, parts, containers, and supplies ----- (X)	133.2	(X)	(*)	(*)
971000	Materials, parts, containers, and supplies, n.s.k. ² ----- (X)	114.2	(X)	473.9	86.5
INDUSTRY 3678, ELECTRONIC CONNECTORS					
	Materials, parts, containers, and supplies ----- (X)	1 375.2	(X)	856.1	
	Mill shapes and forms, except castings:				
331001	Carbon steel ----- 1,000 s tons	(S)	3.2	(S)	3.0
331020	Alloy steel, except stainless ----- do	(S)	.9	(S)	7.1
331031	Stainless steel ----- do	(S)	2.4	(S)	5.2
	Copper and copper-base alloy:				
335728	Bare wire for electrical conduction only ----- mil lb	(S)	2.0	**3.2	7.7
335102	Rod, bar, and mechanical wire, including extruded and/or drawn shapes ----- do	(S)	22.2	**20.9	19.2
335143	Plate, sheet, and strip, including military cups and discs ----- do	**28.0	68.9	(S)	48.7
335152	Pipe and tube ----- do	(D)	(D)	.5	.7
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb	(S)	1.5	(S)	1.1
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do	*6.1	8.3	(S)	5.7
335008	All other aluminum mill shapes and forms ----- do	(S)	7.5	*10.0	11.7
335616	Nickel and nickel-base alloy mill shapes and forms ----- do	(S)	.5	(S)	(D)
335691	Tantalum mill products ----- 1,000 lb	(D)	(D)	-	-
335791	Insulated copper wire and cable (except magnet wire) ----- mil lb	(S)	17.9	(S)	4.2
335770	Magnet wire ----- do	-	-	-	-

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1987 and 1982—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
INDUSTRY 3678, ELECTRONIC CONNECTORS—Con.					
332012	Castings (rough and semifinished): Iron (gray and malleable) and steel	1,000 s tons..	(D)	(D)	(S) 5.7
336005	Aluminum and aluminum-base alloy	mil lb..	(S)	6.2	(S) 1.9
336003	Other nonferrous	do..	(D)	(D)	(S) 51.6
339915	Metal powders	mil lb..	(D)	(D)	(D) (D)
333902	Precious metals, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.), except gold	1,000 troy ounces..			
333905	Gold, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.)	do..	(S)	18.5	(S) 110.1
362111	Fractional horsepower electric motors less than 1 hp	number..	(S)	157.6	(D) (D)
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic-type components		(X)	57.7	(D) (D)
281995	Silicon, hyperpure	1,000 kilograms..	-	-	-
333977	Germanium	1,000 lb..	-	-	-
265001	Paperboard containers, boxes, and corrugated paperboard		(X)	8.4	(X) (*)
333998	Silicon, unalloyed	1,000 s tons..	(D)	(D)	(X) (*)
339913	Ferrites (powder and paste)..		(X)	(D)	(X) -
Glass and glass products:					
322923	Tube blanks, except color television picture		(X)	-	(X) -
322924	Color television picture tube blanks		(X)	-	(X) -
320311	Other than tube blanks		(X)	.3	(X) (D)
Bearings, including mounted and unmounted:					
356218	Ball		(X)	(D)	(X) (*)
356201	Roller		(X)	-	(X) (*)
364300	Current-carrying wiring devices		(X)	12.4	(X) 3.7
382501	Electrical instrument mechanisms and meter movements, including instrument relays		(X)	(D)	(X) (D)
282104	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc., but excluding sheets, rods, tubes, and shapes	mil lb..	(S)	71.2	(S) 21.5
344401	Sheet metal products, except stampings		(X)	71.2	(X) .1
345001	Bolts, nuts, screws, washers, rivets, and screw machine products		(X)	61.7	(X) 26.8
346901	Metal stampings		(X)	190.8	(X) 34.4
308006	Fabricated plastics products (except gaskets, hose, and belting)		(X)	118.6	(X) 18.0
365150	Loud speakers, microphones, and tuners (all types)		(X)	-	(X) -
366301	Electronic communication equipment		(X)	(D)	(X) (D)
357004	Electronic computing equipment and parts		(X)	(D)	(X) (D)
382700	Optical instruments and lenses, except sighting, tracking, and fire control		(X)	(D)	(X) -
333951	Doped chemicals for electronic use		(X)	(D)	(X) (*)
970099	All other materials and components, parts, containers, and supplies		(X)	244.7	(X) 4180.1
971000	Materials, parts, containers, and supplies, n.s.k. ²		(X)	247.0	(X) 303.8
INDUSTRY 3679, ELECTRONIC COMPONENTS, N.E.C.					
Materials, parts, containers, and supplies					
331001	Mill shapes and forms, except castings:		(X)	³⁶ 583.7	(NA) (*)
331020	Carbon steel	1,000 s tons..	(S)	4.7	(NA) (NA)
331031	Alloy steel, except stainless	do..	(S)	19.2	(NA) (NA)
	Stainless steel	do..	(S)	3.8	(NA) (NA)
335728	Copper and copper-base alloy:				
335102	Bare wire for electrical conduction only	mil lb..	**2.6	5.3	(NA) (NA)
	Rod, bar, and mechanical wire, including extruded and/or drawn shapes	do..	(S)	5.0	(NA) (NA)
335143	Plate, sheet, and strip, including military cups and discs	do..	(S)	9.8	(NA) (NA)
335152	Pipe and tube	do..	(S)	2.0	(NA) (NA)
335301	Aluminum and aluminum-base alloy:				
335405	Sheet, plate, and foil	mil lb..	(S)	17.2	(NA) (NA)
	Extruded shapes, including extruded rod, bar, pipe, tube, etc.	do..	(S)	14.6	(NA) (NA)
335008	All other aluminum mill shapes and forms	do..	(S)	11.5	(NA) (NA)
335616	Nickel and nickel-base alloy mill shapes and forms	do..	(S)	4.5	(NA) (NA)
335691	Tantalum mill products	1,000 lb..	(S)	2	(NA) (NA)
335791	Insulated copper wire and cable (except magnet wire)	mil lb..	(S)	76.5	(NA) (NA)
335770	Magnet wire	do..	(S)	7.7	(NA) (NA)
Castings (rough and semifinished):					
332012	Iron (gray and malleable) and steel	1,000 s tons..	(S)	2.4	(NA) (NA)
336005	Aluminum and aluminum-base alloy	mil lb..	(S)	11.4	(NA) (NA)
336003	Other nonferrous	do..	(S)	4.8	(NA) (NA)
339915	Metal powders	do..	(S)	8.8	(NA) (NA)
333902	Precious metals, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.), except gold	1,000 troy ounces..			
333905	Gold, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.)	do..	(S)	11.6	(NA) (NA)
362111	Fractional horsepower electric motors less than 1 hp	number..	(S)	21.0	(NA) (NA)
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic-type components		(S)	5.2	(NA) (NA)
281995	Silicon, hyperpure	1,000 kilograms..	(X)	1 426.8	(NA) (NA)
333977	Germanium	1,000 lb..	(S)	1.4	(NA) (NA)
265001	Paperboard containers, boxes, and corrugated paperboard		(X)	18.4	(NA) (NA)
333998	Silicon, unalloyed	1,000 s tons..	(D)	(*)	(NA) (NA)
339913	Ferrites (powder and paste)..		(X)	39.4	(NA) (NA)

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1987 and 1982—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3679, ELECTRONIC COMPONENTS, N.E.C.—Con.				
322923	Glass and glass products: Tube blanks, except color television picture -----	(X)	.5	(NA)	(NA)
322924	Color television picture tube blanks -----	(X)	.2	(NA)	(NA)
320311	Other than tube blanks -----	(X)	5.6	(NA)	(NA)
	Bearings, including mounted and unmounted: Ball -----	(X)	2.1	(NA)	(NA)
356218	Roller -----	(X)	1.7	(NA)	(NA)
356201	Current-carrying wiring devices -----	(X)	39.9	(NA)	(NA)
364300	Electrical instrument mechanisms and meter movements, including instrument relays -----	(X)	64.2	(NA)	(NA)
382501	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc., but excluding sheets, rods, tubes, and shapes ----- mil lb-----	(S)	18.6	(NA)	(NA)
282104	Sheet metal products, except stampings -----	(X)	41.6	(NA)	(NA)
344401	Bolts, nuts, screws, washers, rivets, and screw machine products -----	(X)	67.3	(NA)	(NA)
345001	Metal stampings -----	(X)	58.0	(NA)	(NA)
346901	Fabricated plastics products (except gaskets, hose, and belting) -----	(X)	111.9	(NA)	(NA)
308006	Loud speakers, microphones, and tuners (all types) -----	(X)	(6)	(NA)	(NA)
365150	Electronic communication equipment -----	(X)	24.5	(NA)	(NA)
366301	Electronic computing equipment and parts -----	(X)	68.1	(NA)	(NA)
357004					
382700	Optical instruments and lenses, except sighting, tracking, and fire control -----	(X)	(6)	(NA)	(NA)
333951	Doped chemicals for electronic use -----	(X)	4.4	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies -----	(X)	62 690.1	(NA)	(NA)
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	1 651.8	(NA)	(NA)

¹For some establishments, data have been estimated from central unit values which are based on quantity-cost relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated; ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

²Total cost of materials of establishments that did not report detailed materials data, including establishments that were not mailed a form.

³Industry content is new for 1987; therefore, 1982 material consumed data are not available.

⁴For 1982, data for these material codes were not collected separately but were included with material code 970099.

⁵For 1982, material code 332012 was included with material code 336003 to avoid disclosing data for individual companies.

⁶For 1987, material codes 333977, 333998, 365150, and 382700 are included with material code 970099 to avoid disclosing data for individual companies.

APPENDIX A. Explanation of Terms

This appendix is in two sections. Section 1 includes items requested of all establishments mailed census of manufactures forms including annual survey of manufactures (ASM) forms. Note that this section also includes several items (number of establishments and companies, value added, classes of products, and specialization and coverage ratios) not included on the report forms but derived from information collected on the forms. Section 2 covers supplementary items requested only from establishments included in the ASM sample. Results of the supplementary ASM inquiries are included in table 3c of this report.

SECTION 1. ITEMS COLLECTED OR DERIVED BASED ON ALL CENSUS OF MANUFACTURES (INCLUDING ASM) REPORT FORMS

Number of establishments and companies—As discussed in the Introduction, a separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

If the company operated at different physical locations, even if the individual locations were producing the same line of goods, a separate report was requested for each location. If the company operated in two or more distinct lines of manufacturing at the same location, a separate report was requested for each activity.

An establishment not in operation for any portion of the year was requested to return the report form with the proper notation in the "Operational Status" section of the form. In addition, the establishment was requested to report data on any employees, capital expenditures, inventories, or shipments from inventories during the year.

In this report, data are shown for establishments in operation at any time during the year. A comparison with the number of establishments in operation at the end of the year will be provided in the Introduction of the General Summary subject report.

Employment and related items—The report forms requested separate information on production workers for a specific payroll period within each quarter of the year and on other employees as of the payroll period which included the 12th of March.

All employees—This item includes all full-time and part-time employees on the payrolls of operating manufacturing establishments during any part of the pay period which included the 12th of the months specified on the report form. Included are all persons on paid sick leave, paid holidays, and paid vacations during these pay periods.

Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average for the payroll periods including the 12th of March, May, August, and November.

Production workers—This item includes workers (up through the line-supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial and guard services, product development, auxiliary production for plant's own use (e.g., power plant), recordkeeping, and other services closely associated with these production operations at the establishment covered by the report. Employees above the working-supervisor level are excluded from this item.

All other employees—This item covers nonproduction employees of the manufacturing establishment including those engaged in factory supervision above the line-supervisor level. It includes sales (including driver salespersons), sales delivery (highway truck drivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office function, executive, purchasing, financing, legal, personnel (including cafeteria, medical, etc.), professional, and technical employees. Also included are employees on the payroll of the manufacturing establishment engaged in the construction of major additions or alterations to the plant and utilized as a separate work force.

In addition to reports sent to operating manufacturing establishments, information on employment during the payroll period which included March 12 and annual payrolls also was requested of auxiliary units (e.g., administrative offices, warehouses, and research and development laboratories) of multiestablishment companies. However, these figures are not included in the totals for individual

industries shown in this report. They are included in the general summary and geographic area reports as a separate category.

Payroll—This item includes the gross earnings of all employees on the payroll of operating manufacturing establishments paid in the calendar year 1987. Respondents were told they could follow the definition of payrolls used for calculating the Federal withholding tax. It includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers of corporations; it excludes payments to proprietors or partners of unincorporated concerns. Also excluded are payments to members of Armed Forces and pensioners carried on the active payroll of manufacturing establishments.

The census definition of payrolls is identical to that recommended to all Federal statistical agencies by the Office of Management and Budget. It should be noted that this definition does not include employers' Social Security contributions or other nonpayroll labor costs, such as employees' pension plans, group insurance premiums, and workers' compensation.

The ASM provides estimates of employers' supplemental labor costs, both those required by Federal and State laws and those incurred voluntarily or as part of collective bargaining agreements. (Supplemental labor costs are explained later in this appendix.)

As in the case of employment figures, the payrolls of separate auxiliary units of multiestablishment companies are not included in the totals for individual industries or industry groups.

Production-worker hours—This item covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave.

Cost of materials—This term refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed, whether purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (1) all raw materials, semifinished goods, parts, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year, (2) electric energy purchased, (3) fuels consumed for heat, power, or the generation of electricity, (4) work done by

others on materials or parts furnished by manufacturing establishments (contract work), and (5) products bought and resold in the same condition. (See discussion of duplication of data below.)

Specific materials consumed—In addition to the total cost of materials, which every establishment was required to report, information also was collected for most manufacturing industries on the consumption of major materials used in manufacturing. The inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Information on the establishments consuming less than a specified amount (usually \$10,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which either administrative records or short forms were used was imputed as "not specified by kind." (See the introduction for the importance of administrative records in the industry.)

Value of shipments—This item covers the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts, such as receipts for contract work performed for others, installation and repair, sales of scrap, and sales of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it, whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, including not only the direct cost of production but also a reasonable proportion of "all other costs" (including company overhead) and profit. (See discussion of duplication of data below.)

Individual products—As in previous censuses, data were collected for most industries on the quantity and value of individual products shipped. In the 1987 census program, information was collected on the output of approximately 11,000 individual product items. The term "product", as used in the census of manufactures, represents the finest level of detail for which output information was requested. Consequently, it is not necessarily synonymous with the term "product" as used in the marketing sense. In some cases, it may be much more detailed and, in other cases, it is more aggregative. For example, "pharmaceutical preparations" was distributed into over 100 terms; whereas, "motor gasoline" was reported as a single item.

Approximately 6,600 of the product items were listed separately on the 1987 census report forms. Data for

about 4,400 products were obtained in the monthly, quarterly, or annual surveys comprising the Current Industrial Reports series of the Census Bureau. Totals for the year 1987 for these items, as derived from the commodity surveys, are shown in the "products shipped" table (table 6a-2).

The list of products for which separate information was collected was prepared after consultation with industry and government representatives. Comparability with previous figures was given considerable weight in the selection of product categories so that comparable 1982 information is presented for most products.

Typically, both quantity and value of shipments information were collected. However, if quantity was not significant or could not be reported by manufacturers, only value of shipments was collected.

Shipments include both commercial shipments and transfers of products to other plants of the same company. For industries in which a considerable portion of the total shipments is transferred to other plants of the same company, separate information on interplant transfers also was collected. Moreover, for products that are used to a large degree within the same establishment as materials or components in the fabrication of other products, total production and often consumption of the item within the plant was collected. Typically, the information on production also was collected for products for which there are significant differences between total production and shipments in a given year because of wide fluctuations in finished goods inventories. Other measures of output of products with long production cycles were used as appropriate and feasible.

Classes of products—To summarize the product information, the separate products were aggregated into classes of products that, in turn, were grouped into all primary products of each industry. The code structure used is a seven-digit number for the individual product, a five-digit number for the class of product, and a four-digit number for the total primary products in an industry. (See Introduction, Industry Classification of Establishments, for application of the coding structure to the assignment of SIC codes for establishments.)

In the 1987 census, the 11,000 products were grouped into approximately 1,500 separate classes on the basis of general similarity of manufacturing processes, types of materials used, and the like. However, the grouping of products was affected by the economic significance of the class and, in some cases, dissimilar products were grouped because the products were not sufficiently significant to warrant separate classes.

Duplication in cost of materials and value of shipments—The aggregate of the cost of materials and value of shipments figures for industry groups and for all manufacturing industries includes large amounts of duplication since the products of some industries are used as materials by others. This duplication results, in part, from the

addition of related industries representing successive stages in the production of a finished manufactured product. Examples are the addition of flour mills to bakeries in the food group and the addition of pulp mills to paper mills in the paper and allied products group of industries. Estimates of the overall extent of this duplication indicate that the value of manufactured products exclusive of such duplication (the value of finished manufactures) tends to approximate two-thirds of the total value of products reported in the annual survey.

Duplication of products within individual industries is significant within a number of industry groups, e.g., machinery and transportation industries. These industries frequently include complete machinery and their parts. In this case, the parts made for original equipment are materials consumed for assembly plants in the same industry.

Even when no significant amount of duplication is involved, value of shipments figures are deficient as measures of the relative economic importance of individual manufacturing industries or geographic areas because of the wide variation in ratio of materials, labor, and other processing costs of value of shipments, both among industries and within the same industry.

Before 1962, cost of materials and value of shipments were not published for some industries which included considerable duplication. Since then, these data have been published for all industries at the United States level and beginning in 1964, for all geographic levels.

Value added by manufacture—This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments (products manufactured plus receipts for services rendered). The result of this calculation is adjusted by the addition of value added by merchandising operations (i.e., the difference between the sales value and the cost of merchandise sold without further manufacture, processing, or assembly) plus the net change in finished goods and work-in-process between the beginning- and end-of-year inventories.

For those industries where value of production is collected instead of value of shipments (see footnote in table 1a), value added is adjusted only for the change in work-in-process inventories between the beginning and end of year. For those industries where value of work done is collected, the value added does not include an adjustment for the change in finished goods or work-in-process inventories.

"Value added" avoids the duplication in the figure for value of shipments that results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

New and used capital expenditures—For establishments in operation and any known plants under construction, manufacturers were asked to report their new expenditures for (1) permanent additions and major alterations to

manufacturing establishments, and (2) machinery and equipment used for replacement and additions to plant capacity if they were of the type for which depreciation accounts were ordinarily maintained.

The totals for new expenditures include expenditures leased from nonmanufacturing concerns through capital leases. New facilities owned by the Federal Government but operated under contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations are excluded. Also excluded are expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses.

Manufacturers also were requested to report the value of all used buildings and equipment purchased during the year at the purchase price. For any equipment or structure transferred for the use of the reporting establishment by the parent company or one of its subsidiaries, the value at which it was transferred to the establishment was to be reported. Furthermore, if the establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported under used capital expenditures.

Total expenditures for used plant and equipment is a universe figure; it is collected on all census forms. However, the breakdown of this figure between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. The data for total new capital expenditures, new building expenditures, and new machinery expenditures, as well as the data for total used expenditures, are shown in table 3b.

End-of-year inventories—Respondents were asked to report their 1986 and 1987 end-of-year inventories at cost or market. Effective with the 1982 Economic Censuses, this change to a uniform instruction for reporting inventories was introduced for all sector reports. Prior to 1982, respondents were permitted to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). In 1982, LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

SECTION 2. ITEMS COLLECTED ONLY ON ASM REPORT FORMS

The following items were collected only from establishments included in the ASM sample:

1. **Supplemental labor costs**—Supplemental labor costs are divided into legally required expenditures and payments for voluntary programs. The legally required portion consists primarily of Federal old age and survivors' insurance, unemployment compensation, and workers' compensation. Payments for voluntary programs include all programs not

Because of this change in reporting instructions, the 1982 through 1987 data for inventories and value added by manufacture included in the tables of this report are not comparable to the prior-year data shown in table 1a of this report and in historical census of manufactures and annual survey of manufactures publications.

In using inventory data by stage of fabrication for "all industries" and at the two-digit industry level, it should be noted that an item treated as a finished product by an establishment in one industry may be reported as a raw material by another establishment in a different industry. For example, the finished-product inventories of a steel mill would be reported as raw materials by a stamping plant. Such differences are present in the inventory figures by stage of fabrication shown for individual industries, industry groups, and "all manufacturing", which are aggregates of figures reported by establishments in specified industries.

Specialization and coverage ratios—These items are not collected on the report forms but are derived from the data shown in table 5b. An establishment is classified in a particular industry if its shipments of primary products of that industry exceed in value its shipments of the products of any other single industry.

As noted in the introduction, an establishment's shipments include those products assigned to an industry (primary products), those considered primary to other industries (secondary products), and receipts for miscellaneous activities (merchandising, contract work, resales, etc.). Specialization and coverage ratios have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in tables 1a through 5a and data on product shipments shown in tables 6a through 6c.

Specialization ratio represents the ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for the establishments classified in the industry.

Coverage ratio represents the ratio of primary products shipped by the establishments classified in the industry to the total shipments of such products that are shipped by all manufacturing establishments wherever classified.

specifically required by legislation whether they were employer initiated or the result of collective bargaining. They include the employer portion of such plans as insurance premiums, premiums for supplemental accident and sickness insurance, pension plans, supplemental unemployment compensation, welfare plans, stock purchase plans on which the employer payment is not subject to withholding tax, and deferred profit-sharing plans.

They exclude such items as company-operated cafeterias, in-plant medical services, free parking lots, discounts on employee purchases, and uniforms and work clothing for employees. While the excluded items do benefit employees and all or part of their cost generally is similar to the items covered in the ASM labor costs statistics, accounting records generally do not provide reliable figures on net employee benefits of these types.

2. **Retirements of depreciable assets**—Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during 1987. When a complete operation or establishment changed ownership, the respondent was instructed to report the value of the assets sold at the original cost as recorded in the books of the seller. The respondent also was requested to report retirements of equipment or structures owned by a parent company that the establishment was using as if it were a tenant.
3. **Depreciation charges for fixed assets**—This item includes depreciation and amortization charged during the year against assets. Depreciation charged against fixed assets acquired since the beginning of the year and against assets sold or retired during the year are components of this category. Respondents were requested to make certain that they did not report accumulated depreciation.
4. **Rental payments**—Total rental payments is collected on all census forms. However, the breakdown between rental payments for buildings and other structures and rental payments for machinery and equipment is collected only on the ASM forms. This item includes rental payments for the use of all items for which depreciation reserves would be maintained if they were owned by the establishment, e.g., structures and buildings, and production, office, and transportation equipment. Excluded are royalties and other payments for the use of intangibles and depletable assets, and land rents where separable.
- When an establishment of a multiestablishment company was charged rent by another part of the same company for the use of assets owned by the company, it was instructed to exclude that cost from rental payments. However, the book value (original cost) of these company-owned assets was to be reported as assets of the establishment at the end of the year.
If there were assets at an establishment rented from another company and the rents were paid centrally by the head office of the establishment, the company was instructed to report these rental payments as if they were paid directly by the establishment.
5. **Depreciable assets**—Total value of gross depreciable assets is collected on all census forms.

However, the detail for depreciable assets is collected only on the ASM forms. The data encompass all fixed depreciable assets on the books of establishments at the beginning and end of the year. The values shown (book value) represent the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all buildings, structures, machinery, and equipment (production, office, and transportation equipment) for which depreciation reserves are maintained. Excluded are nondepreciable capital assets, including inventories and intangible assets, such as timber and mineral rights.

The definition of fixed depreciable assets is consistent with the definition of capital expenditures. For example, expenditures include actual capital outlays during the year, rather than the final value of equipment put in place and buildings completed during the year. Accordingly, the value of assets at the end of the year includes the value of construction in progress. In addition, respondents were requested to make certain that assets at the beginning of the year plus new and used capital expenditures, less retirements, equalled assets at the end of the year.

6. **New and used capital expenditures**—The data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used capital expenditures are collected on all census forms. However, the breakdown between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. (See further explanation on capital expenditures in section 1.)
7. **Quantity of electric energy consumed for heat and power**—Data on the cost of purchased electric energy were collected on all census forms. However, data on the quantity of purchased electric energy were collected only on the ASM forms. In addition, information was collected on the quantity of electric energy generated by the establishment and the quantity of electric energy sold or transferred to other plants of the same company.
8. **Breakdown of new capital expenditures for machinery and equipment**—ASM establishments were requested to separate their capital expenditures for new machinery and equipment into (1) automobiles, trucks, etc., for highway use, (2) computers and peripheral data processing equipment, and (3) all other.

The category "automobiles, trucks, etc., for highway use" is intended to measure expenditures for vehicles designed for highway use that were acquired through a purchase or lease-purchase agreement.

Vehicles normally operating off public highways (vehicles specifically designed to transport materials, property, or equipment on mining, construction, logging, and petroleum development projects) are excluded from this item.

9. **Foreign content of cost of materials**—Establishments included in the ASM sample panel were requested to provide information on foreign-made materials purchased or transferred from foreign sources. This includes materials acquired from a central warehouse or other domestic establishment of the same company but made in an operation outside of the 50 States, District of Columbia, Puerto Rico, or U.S. territories.
10. **Cost of purchased services**—ASM establishments were requested to provide information on the cost of purchased services for the repair of buildings and other structures, the repair of machinery, and communication services. Included in the cost of purchased services for the repair of buildings and machinery are payments made for all maintenance and repair work on buildings and equipment, such as painting, roof repairs, replacing parts, and overhauling equipment. Such payments made to other establishments of the same company and for repair and maintenance of any leased property also are included. Extensive repairs or reconstruction that were capitalized are considered capital expenditures for used buildings and machinery and are, therefore, excluded from this item. Repair and maintenance costs provided by an owner as part of a rental contract or incurred directly by an establishment in using its own work force also are excluded.

Three basic approaches were utilized to produce these statistics.

1. For items 1 through 6, data were estimated (imputed) for all non-ASM establishments using the available data in the establishment record and industry-based parameters. The statistics were then generated by simply tabulating all census records including the imputed value for non-ASM establishments and the unweighted value for ASM establishments. Separate imputation rates were developed and are shown in the table. For quantity of purchased electricity for heat and power (item 7), a similar procedure was used; however, the imputation parameters were geographically-based instead of industry-based. For quantities of generated less sold electricity, no imputation was performed for non-ASM establishments. The estimates for these items are simply tabulations of unweighted ASM values.

Since the published statistics for these items were developed from the complete census universe and not just the ASM establishments, there are no sampling variances associated with these statistics. However, there is an unknown level of bias for each of the items due to the imputation of the non-ASM establishments. This bias is felt to be small due to the strong correlation between the items being imputed and the collected items that were used to generate the impute values.

2. For items 8 and 9, the estimates were developed using a ratio estimation methodology. For item 8, an estimate of the breakout of new capital expenditures for machinery and equipment into the three categories was made from ASM establishments reporting these categories. The estimated proportions were then applied to the corresponding Census value for new capital expenditures for machinery and equipment to produce the estimates.

The estimates for item 9, foreign content of cost of materials, were developed in a similar manner based on costs of parts, supplies, and components (item 5a) as the control total for the three categories.

For items 8 and 9, an adjustment ratio of the following form was computed.

$$R_j = \frac{NM_c}{TME_{asm}}$$

where:

NM_c = the census value of new capital expenditures for machinery and equipment

TME_{asm} = the weighted ASM value of new capital expenditures for machinery and equipment from reporters of the detailed breakout data

3. For item 10, cost of purchased services, the estimates were made by simply tabulating weighted data for all the ASM records that reported the item. A response coverage ratio (a measure of the extent to which respondents reported for each item) is shown in table 3c for the three types of services. It is derived for each item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight, see appendix B) for those ASM establishments that reported the specific inquiry to the weighted total employment for all ASM establishments classified in the industry.

APPENDIX B.

Annual Survey of Manufactures (ASM) Sampling and Estimating Methodologies

DESCRIPTION OF SURVEY SAMPLE

The Annual Survey of Manufactures (ASM) contains two components. The mail portion of the survey is a probability sample of about 56,000 manufacturing establishments selected from a total of about 220,000 establishments. These 220,000 establishments represent all manufacturing establishments of multiunit companies and all single establishment companies mailed schedules in the 1982 Census of Manufactures. This mail portion is supplemented annually by a Social Security Administration list of new manufacturing establishments opened after 1982 and a list of new multiunit manufacturing establishments identified from the Census Bureau's Company Organization Survey.

The 1984 through 1988 ASM sample differs slightly from the previous sample. For the current panel, all establishments of companies with 1982 shipments in manufacturing in excess of \$500 million were included in the survey panel with certainty. There are approximately 500 such companies collectively accounting for approximately 18,000 establishments. For the remaining portion of the mail survey, the establishment was defined as the sampling unit. For this portion, all establishments with 250 employees or more and establishments with a very large value of shipments also were included in the survey panel with certainty. A total of 12,100 establishments were selected from this portion of the universe with certainty. Therefore, of the 56,000 manufacturing establishments included in the ASM panel, approximately 31,000 are selected with certainty. These certainty establishments collectively account for approximately 80 percent of the total value of shipments in the 1982 census.

Smaller establishments in the remaining portion of the mail survey were sampled with probabilities ranging from 0.999 to 0.005 in accordance with mathematical theory for optimum allocation of a sample. The probabilities of selection assigned to the smaller establishments were proportional to measures of size determined for each establishment. The measures of size depend directly upon each establishment's 1982 product class values and the historic variability of the year-to-year shipments of each product class. Product classes displaying more volatile year-to-year change in shipments at the establishment level were sampled at a heavier rate.

This method of assigning measures of size was used in order to maximize the precision (that is, minimize the variance of estimates of the year-to-year change) in the value of product class shipments. Implicitly, it also gave weight differences in employment, value added, and other

general statistics, since these are highly correlated with value of shipments. Individual sample selection probabilities were obtained by multiplying each establishment's final measure of size by an overall sampling fraction coefficient calculated to yield a total expected sample size.

The sample selection procedure gave each establishment in the sampling frame an independent chance of selection. This method of independent selection permits the rotation of small establishments out of a given sample panel without introducing a bias into the survey estimates.

The nonmail portion of the survey includes all single-establishment companies that were tabulated as administrative records in the 1982 Census of Manufactures. Although this portion contained approximately 130,000 establishments, it accounted for less than 2 percent of the estimate for total value of shipments at the total manufacturing level. This portion was not sampled; rather, the data for every establishment in this group were estimated based on selected information obtained annually from the administrative records of the Internal Revenue Service and the Social Security Administration. This administrative-record information, which includes payroll, total employment, industry classification, and physical location of the establishment, was obtained under conditions which safeguard the confidentiality of both tax and census records. Estimates of data other than payroll and employment for these small establishments were developed from industry averages.

The corresponding estimates for the mail and nonmail establishments were added together, along with the base-year differences, as defined in the Description of Estimating Procedure section, to produce the figures shown in this publication.

DESCRIPTION OF ESTIMATING PROCEDURES

Most of the ASM estimates for the years 1983-1986 were computed using a difference estimation procedure. For each item, a base-year difference was developed. This base-year difference is equal to the difference between the 1982 census published number for an item total and the linear ASM estimate of the total for 1982. The ASM linear estimate was obtained by multiplying each sample establishment's data by its sample weight (the reciprocal of its probability of selection) and summing the weighted values.

These base-year differences were then added to the corresponding current-year linear estimates, which include the sum of the estimates for the mail and nonmail establishments, to produce the estimates for the years 1983-1986. Estimates developed by this procedure usually are far more reliable than comparable linear estimates developed from the current sample data alone.

The 1987 sample estimates for the purchased service items, shown in table 3c, are strictly ASM linear estimates, however, developed only from ASM establishments that reported the specific item.

The remaining estimates in table 3c, showing the breakdown of expenditures for new machinery and equipment and costs of parts (separated into purchases from foreign sources and purchases from domestic sources), were computed as ratio estimates. To do this, linear estimates of the new machinery detail items were developed from the ASM establishments and were ratio adjusted to the corresponding census total for new machinery. In a similar fashion, the ASM linear estimates of the detailed purchased materials items were ratio adjusted to the corresponding census total for cost of parts.

QUALIFICATIONS OF THE DATA

The estimates developed from the sample are apt to differ somewhat from the results of a survey covering all companies in the sampled lists but otherwise conducted under essentially the same conditions as the actual sample survey. The estimates of the magnitude of the sampling errors (the differences between the estimates obtained and the results theoretically obtained from a comparable, complete-coverage survey) are provided by the standard errors of the estimates.

The particular sample selected for the ASM is one of a large number of similar probability samples that, by chance, might have been selected under the same specifications. Each of the possible samples would yield somewhat different sets of results, and the standard errors are measures of the variation of all the possible sample estimates around the theoretical, comparable, complete-coverage values.

Estimates of the standard errors have been computed from the sample data for selected statistics in this report. They are presented in the form of relative standard errors (the standard errors divided by the estimated values to which they refer).

In conjunction with its associated estimate, the relative standard error may be used to define confidence intervals (ranges that would include the comparable, complete-coverage value for specified percentages of all the possible samples).

The complete coverage value would be included in the range:

1. From one standard error below to one standard error above the derived estimate for about two-thirds of all possible samples.
2. From two standard errors below to two standard errors above the derived estimate for about 19 of 20 of all possible samples.
3. From three standard errors below to three standard errors above the derived estimate for nearly all samples.

An inference that the comparable, complete-survey result would be within the indicated ranges would be correct in approximately the relative frequencies shown. Those proportions, therefore, may be interpreted as defining the confidence that the estimates from a particular sample would differ from complete-coverage results by as much as one, two, or three standard errors, respectively.

For example, suppose an estimated total is shown as 50,000 with an associated relative standard error of 2 percent, that is, a standard error of 1,000 (2 percent of 50,000). There is approximately 67 percent confidence that the interval 49,000 to 51,000 includes the complete-coverage total, about 95 percent confidence that the interval 48,000 to 52,000 includes the complete-coverage total and almost certain confidence that the interval 47,000 to 53,000 includes the complete coverage total.

In addition to the sample errors, the estimates are subject to various response and operational errors: errors of collection, reporting, coding, transcription, imputation for nonresponse, etc. These operational errors also would occur if a complete canvass were to be conducted under the same conditions as the survey. Explicit measures of their effects generally are not available. However, it is believed that most of the important operational errors were detected and corrected in the course of the Bureau's review of the data for reasonableness and consistency. The small operational errors usually remain. To some extent, they are compensating in the aggregated totals shown. When important operational errors were detected too late to correct the estimates, the data were suppressed or were specifically qualified in the tables.

As derived, the estimated standard errors included part of the effect of the operational errors. The total errors, which depend upon the joint effect of the sampling and operational errors, are usually of the order of size indicated by the standard error, or only moderately higher. However, for particular estimates, the total error may considerably exceed the standard errors shown.

The concept of complete coverage under the conditions prevailing for the ASM is not identical to the complete coverage of the census of manufactures, as the censuses have been conducted. Nearly all types of operational errors that affect the ASM also occur in the censuses. The ASM and the censuses, are conducted under quite different conditions, and operational errors can be better controlled in the ASM than in the censuses. As a result, for many of the census figures, the errors are of the same order of size as the total errors of the corresponding annual survey estimates. The differences between the census and ASM operating conditions also disturb, to some degree, the comparability of the ASM and census data.

Any figures shown in the tables in this publication having an associated standard error exceeding 15 percent may be of limited reliability. However, the figure may be combined with higher-level totals, creating a broader aggregate, which then may be of acceptable reliability.

APPENDIX C.

Changes in Census of Manufactures

Product Classes for 1987

[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product classes were revised for 1987. Listed below are the revisions to the product classes]

1987	1982	1987	1982	1987	1982	1987	1982	
30521	30411	30899 3089A	3079K pt	34919	34948	35483	36233	
30522	30412	32295	32291 pt	34921	3494B	35484	35496	
30523	30413	32296	32292 pt	34922	3494C	35485	35495 pt 35497	
30524	30414	32297	32294 pt	34923	3494D	35533	35531 pt	
30525	30415	32298	32291 pt 32292 pt 32294 pt	34924	3494E	35534	35532 pt	
30526	30416	32934	32311	32317	34925	3494F	35543	35541 35542 pt
30534	32935	32312	32317	34926	3494G	35544	35542 pt	
30535	32936	32927	32928 32929	3523C	35234 pt 35237 35238 pt	35558	35557 pt	
30537	32937	32961	32963 32965	3523E	35234 pt 35238 pt	35561	35511	
30538	32938	32962	32964 32966	3523F	3523A 3523B	35562	35512	
30539	32939	33152	33152 34967	35246	35243 35245	35563	35513 pt	
30611	3069A pt	33391	33331	3531A	35311	35591	35591 35699 pt	
30612	3069A pt	33392	33334	3531B	35312	35597	35494	
30613	3069A pt	33398	33321 33323 33399	3531C	35317	35599	35595 pt 36360 36362	
30614	3069B pt	33561	33569	3531E	35314 pt	35616	3561C	
30615	3069B pt	33562	33563	3531F	35316	35631	35631 pt	
30616	3069B pt	33630	33611	3531G	35318 pt	35651	35513 pt 35514 pt 35691 pt	
30617	3069B pt	33640	33620 pt 33691 pt 33692 pt 33693 pt	3531H	35313 pt 35318 pt 35319 pt	35652	35513 pt 35514 pt 35691 pt	
3069C	3069C 35557 pt	33650	33612	3531K	35319 pt 35361 pt 35371 pt	35676	35672	
3069E	30310	33660	33620 pt	3531M	35313 pt 35314 pt 35319 pt 35372 pt	35692	35694 35695 35696	
30810	30792	33690	33691 pt 33692 pt 33693 pt	35337	35331 35332 pt	35697	35699 pt	
30820	3079K pt	34234	34232 pt	35338	35332 pt	35711	35731 36629 pt	
30830	3079K pt	34235	34232 pt 35531 pt 35532 pt	35339	35333	35712	35734 pt 35735 pt	
30840	30794	34236	34233	3533A	35335	35721	35732 pt	
30850	30795	34441	34446	3533B	35336	35722	35734 pt 35735 pt	
30861	30797	34443	34446	35363	35361 pt	35751	35732 pt 36612 pt	
30862		34447		35364	35362 pt			
30863		34448						
30864		34449						
30865								
30866								
30870	3079K pt	34461	34460	35373	35362 pt 35371 pt	35752	35734 pt 35735 pt	
30880	3079J pt 3079K pt	34462		35374	35362 pt 35372 pt	35771	35732 pt	
30891	3079J pt 3079K pt	34463						
30892	3079J pt 3079K pt	34464						
30893	3079J pt 3079K pt	34465						
30894	3079J pt 3079K pt	34696	34699	3541D	35411 35412	35772	35734 pt 35735 pt	
30895	3079J pt	34911	3494A	35430	35650	35781	35743	
30896	2499A pt 3079J pt 3079K pt	34912		35454	35453	35782	35744	
30897	3079J pt 3079K pt	34913		35455	35452	35783	35745	
30898	3079J pt 3079K pt	34914				3585C	3585A 36993	
		34915						
		34916						
		34917	34949	35481	36231	3585D	3585B 36994 pt	
		34918	34947	35482	36232			

[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product classes were revised for 1987. Listed below are the revisions to the product classes]

1987	1982	1987	1982	1987	1982	1987	1982
35931	35996 35997	36411	36410	36991—Con. 36995	36629 pt—Con.	38731—Con.	38734—Con. 38736 38737
		36412	36994 pt	36997	35497 pt 36629 pt	39113 39114	39112
35932	35998	36520	36521 pt	36998	36994 pt		
35933	35999	36613	35732 pt 36612 pt	3714A	37143	39153 39154	39151
35941	35617 35618 35631 pt	36614	36612 pt	37999	37994 37998	39447	36629 pt 39447
35942	3561A 3561B 35631 pt	36631	36621 36629 pt	38121	38111	39493	39494 pt
35961	35760	36632	36622	38122	36625 pt 36629	39495	3079k pt
35962		36691	36624	38210	38112 38113 pt	39496	39494 pt
35963		36692	36626	38260	38320 38326	39523	39521 39522 pt
36123	36125	36693	36628	38271	38324	39524	39522 pt
36126		36714	36711 36712	38272 38273	38325	39651	39630
36251	36138 pt 36794	36715	36799 pt	38295	36625 pt 38293	39654	39641
36252	36221	36720	36797	38296	38113 pt	39656	39642
36253	36222	36799	36629 pt 36799 pt	38440	36931	39998	39620
36254	36138 pt 36223	36950	35732 pt 36792	38450	36930 36933	39999	39995
36330	36331 36333	36991 36992	36629 pt	38731	38734	97372	36522
36395	36361 36394 36399					97819	36521 pt

APPENDIX D.

Changes in Census of Manufactures

Product Codes for 1987

[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product codes were revised for 1987. Listed below are the revisions to the product codes. The terms published and collected are defined as follows: (1) published refers to the code used in the published reports for 1987 and 1982, and (2) collected refers to the code appearing on the report forms for 1987.]

1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published		
30118 00	30118 00	30118 19 30118 20	30539 77	32939 77	32939 77	30830 11 30830 13 30830 19	30793 01 30793 03 30793 09	3079K 90	30892 20— Con.	3079D 33— Con.	3079J 61 pt —Con. 3079J 66 pt 3079K 93 pt		
3011A 39	3011A 39	3011A 33 3011A 35	30539 79	32939 79	32939 79	30840 11	30794 21	30794 21	30892 30	3079D 35	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
3011C 29	3011C 29	3011C 24 3011C 26 3011C 27	30611 00	3069A 00	3069A 11	30840 12	30794 22	30794 22			3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
30521 00	30411 00	30411 00	30612 00	3069A 00	3069A 12 3069A 15	30840 13	30794 23	30794 23			3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
30522 00	30412 00	30412 00	30613 00	3069A 00	3069A 13 3069A 14 3069A 16	30840 14	30794 24	30794 24	30892 90	3079D 39	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
30523 00	30413 00	30413 00	30614 00	3069B 00	3069B 11	30840 15	30794 25	30794 25			3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
30524 00	30414 00	30414 00	30615 00	3069B 00	3069B 12 3069B 13 3069B 14 3069B 19	30840 19	30794 26	30794 26			3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
30525 00	30415 00	30415 00	30616 00	3069B 00	3069B 21	30850 00	30795 00	30795 00			3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
30526 00	30416 00	30416 00	30617 00	3069B 00	3069B 29	30861 00	30797 41	30797 41	30893 00	3079F 22	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
30534 11	32934 11	32934 11	30618 00	3069B 00	3069B 21	30862 10 30862 20 30862 90	30797 51 30797 53 30797 59	30797 42			3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
30534 13	32934 13	32934 13	30619 00	3069B 00	3069B 29	30863 10 30863 90	30797 61 30797 69	30797 44			3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
30534 15	32934 15	32934 15	30620 00	3069B 00	3069B 29	30864 10 30864 20 30864 30 30864 90	30797 71 30797 73 30797 75 30797 79	30797 45	30894 01	30798 01	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
30534 17	32934 17	32934 17	30621 00	3069B 00	3069B 29	30865 10 30865 20 30865 30 30865 40 30865 90	30797 81 30797 83 30797 85 30797 86 30797 89	30797 46			3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
30535 11	32935 11	32935 11	30622 00	3069B 00	3069B 29	30866 10	30797 43	30797 43	30894 02	30798 02	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
30535 13	32935 13	32935 13	30623 00	3069B 00	3069B 29	30866 90	30797 47	30797 47			3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
30535 15	32935 15	32935 15	30624 00	3069B 00	3069B 29	30870 12 30870 13	30791 01 30791 02	3079K 99	30894 03	30798 03	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt		
30535 17	32935 17	32935 17	30625 00	3069B 00	3069B 29	30880 00	3079F 20	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt			30894 04	30798 04	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30535 19	32935 19	32935 19	30626 00	3069B 00	3069B 29	30881 01	3079C 11	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt			30894 05	30798 05	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30535 21	32935 21	32935 21	30627 00	3069B 00	3069B 29	30881 03	3079C 13	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt			30894 06	30798 06	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30535 23	32935 23	32935 23	30628 00	3069B 00	3069B 29	30881 09	3079C 19	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt			30894 07	30798 07	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30535 25	32935 25	32935 25	30629 00	3069B 00	3069B 29	30892 10	3079D 31	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt			30894 09	30798 09	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30536 21	32936 21	32936 21	30630 00	3069B 00	3069B 29	30892 20	3079D 33	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt			30895 01	30799 01	3079J 61 pt
30536 22	32936 22	32936 22	30631 00	3069B 00	3069B 29								
30536 25	32936 25	32936 25	30632 00	3069B 00	3069B 29								
30536 26	32936 26	32936 26	30633 00	3069B 00	3069B 29								
30536 30	32936 30	32936 30	30634 00	3069B 00	3069B 29								
30536 35	32936 35	32936 35	30635 00	3069B 00	3069B 29								
30537 29	32937 29	32937 29	30636 00	3069B 00	3069B 29								
30537 39	32937 39	32937 39	30637 00	3069B 00	3069B 29								
30537 41	32937 41	32937 41	30638 00	3069B 00	3069B 29								
30537 43	32937 43	32937 43	30639 00	3069B 00	3069B 29								
30537 49	32937 49	32937 49	30640 00	3069B 00	3069B 29								
30538 10	32938 10	32938 10	30641 00	3069B 00	3069B 29								
30538 13	32938 13	32938 13	30642 00	3069B 00	3069B 29								
30538 15	32938 15	32938 15	30643 00	3069B 00	3069B 29								
30538 17	32938 17	32938 17	30644 00	3069B 00	3069B 29								
30538 19	32938 19	32938 19	30645 00	3069B 00	3069B 29								
30539 70	32939 70	32939 70	30646 00	3069B 00	3069B 29								
30539 73	32939 73	32939 73	30647 00	3069B 00	3069B 29								
30539 75	32939 75	32939 75	30648 00	3069B 00	3069B 29								

[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product codes were revised for 1987. Listed below are the revisions to the product codes. The terms published and collected are defined as follows: (1) published refers to the code used in the published reports for 1987 and 1982, and (2) collected refers to the code appearing on the report forms for 1987.]

[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product codes were revised for 1987. Listed below are the revisions to the product codes. The terms published and collected are defined as follows: (1) published refers to the code used in the published reports for 1987 and 1982, and (2) collected refers to the code appearing on the report forms for 1987.]

1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
33152 03— Con.	33152 03— Con.	33152 11 pt —Con. 34967 19 pt	33157 42— Con.	33157 42— Con.	33157 31 pt —Con. 33157 71 pt	33561 66— Con.	33561 66— Con.	33569 92— Con.	34236 21	34236 21	34233 21
33152 05	33152 05	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 13 pt 34967 17 pt 34967 19 pt	33157 43	33157 43	33157 31 pt 33157 61 pt 33157 71 pt	33562 78 33563 91 33569 91	33562 78 33563 91 33569 91		34236 31	34236 31	34233 31
33152 07	33152 07	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33159 44 33159 45 33159 48	33159 44 33159 45 33159 48	33159 49	33640 11 33640 21	33620 42 33691 51	33620 42 33691 51	34236 41	34236 41	34233 41
33152 09	33152 09	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33159 99	33159 99	33159 77 33159 98	33640 31 33640 41 33640 51 33650 11	33692 31 33693 71 33693 91 33612 11	33692 31 33693 71 33693 91 33612 11	34292 12 34298 99 34298 99 34298 98	34292 12 34298 99 34298 99	34298 98
33152 10	33152 10	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33211 21	33211 21	33211 22 pt 33211 24 pt 33211 27 pt 33211 30 pt	33640 41 33640 51 33650 11	33693 71 33693 91 33612 11	33693 71 33693 91 33612 11	34320 01 34320 03 34320 05 34320 07	34320 01 34320 03 34320 05 34320 07	34320 04
33152 12	33152 12	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33211 23	33211 23	33211 22 pt 33211 24 pt 33211 27 pt 33211 30 pt	33650 31 33650 51	33612 31 33612 51	33612 31 33612 51	34320 09 34320 11	34320 09 34320 11	34320 08
33152 14	33152 14	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33211 25	33211 25	33211 33 pt 33211 36 pt 33211 39 pt 33211 42 pt	33650 61	33612 61	33612 61	34320 14 34320 25 34320 35	34320 14 34320 25 34320 35	34320 98
33152 16	33152 16	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33217 31	33217 31	33217 32 pt 33217 34 pt 33217 37 pt 33217 40 pt	33660 22 33660 23	33620 22 33620 23	33620 22 33620 23	34320 71 34320 74 34320 75	34320 71 34320 74 34320 75	34320 98
33152 22	33152 22	33152 33 pt 34967 23 pt	33217 33	33217 33	33217 32 pt 33217 34 pt 33217 37 pt 33217 40 pt	33660 24 33660 25 33660 31	33620 24 33620 25 33620 31	33620 24 33620 25 33620 31	34320 76 34320 80 34320 82	34320 76 34320 80 34320 82	34320 77
33152 23	33152 23	33152 23 34967 19 pt	33217 35	33217 35	33217 43 pt 33217 46 pt 33217 49 pt 33217 52 pt	33660 41	33620 52	33620 61 pt	34320 84 34320 86	34320 84 34320 86	34320 56
33152 25	33152 25	33152 25 34967 21	33252 11	33252 11	33252 12 33252 13	33690 15	33692 11	33692 11	34320 94 34320 95	34320 94 34320 95	34320 43
33152 30	33152 30	33152 33 pt 34967 23 pt	33391 00	33331 00	33331 00	33690 21	33692 33	33692 33	34320 96 34320 97	34320 96 34320 97	34320 44
33156 15 33156 17	33156 15 33156 17	33156 13	33392 31	33334 31	33334 31	33690 25	33692 41	33692 41	34320 99	34320 99	34320 98 pt
33156 22 33156 24	33156 22 33156 24	33156 21	33392 37	33334 37	33334 35 pt	33690 91 33690 98	33693 94 33693 99	33693 99	34320 99	34320 99	34320 98 pt
33157 21	33157 21	33157 31 pt 33157 61 pt 33157 71 pt	33392 41	33334 41	33334 41	33991 91 33991 98	33991 91 33991 98	33991 99	34432 44	34432 44	34432 45
33157 22	33157 22	33157 31 pt 33157 61 pt 33157 71 pt	33392 43	33334 43	33334 45 pt	34234 11	34234 11	34232 31	34432 46 34432 48	34432 46 34432 48	34432 47
33157 23	33157 23	33157 31 pt 33157 61 pt 33157 71 pt	33392 49	33334 49	33334 48 pt	34234 22	34234 22	34232 83	34432 52 34432 54 34432 56 34432 98	34432 52 34432 54 34432 56 34432 98	34432 99
33157 24	33157 24	33156 21	33392 51	33334 51	33334 35 pt 33334 38 pt 33334 45 pt 33334 48 pt	34234 33	34234 33	34232 85	34433 13	34433 13	34433 12 34433 14 34433 48 pt
33157 25	33157 25	33157 25 34967 21	33392 55	33334 55	33334 55	34235 11	34235 11	34232 53	34433 17	34433 17	34433 16 34433 18 34433 48 pt
33157 26	33157 26	33156 21	33398 01	33321 00	33321 00	34235 12	34235 12	34232 54			
33157 27	33157 27	33157 31 pt 33157 61 pt 33157 71 pt	33398 05	33323 00	33323 00	34235 21	34235 21	34232 56	34433 22	34433 22	34433 21 34433 23 34433 48 pt
33157 28	33157 28	33157 31 pt 33157 61 pt 33157 71 pt	33398 73	33398 73	33398 85	34235 22	34235 22	34232 58	34433 32	34433 32	34433 31 34433 33 34433 48 pt
33157 29	33157 29	33157 31 pt 33157 61 pt 33157 71 pt	33398 99	33398 99	33398 23 33398 98 33399 81	34235 31	34235 31 35533 81	34232 99 pt 35531 85 pt 35532 81 pt	34433 38	34433 38	34433 45
33157 30	33157 30	33152 33 pt 34967 23 pt	33392 41	33334 41	33334 41	33991 91 33991 98	33991 91 33991 98	33991 99	34433 39	34433 39	34433 48 pt
33157 31	33157 31	33156 13	33392 43	33334 43	33334 45 pt	34234 11	34234 11	34232 31	34433 49	34433 49	34433 48 pt
33157 32	33157 32	33156 13	33392 49	33334 49	33334 48 pt	34234 22	34234 22	34232 83	34433 50	34433 50	34433 48 pt
33157 33	33157 33	33156 13	33392 51	33334 51	33334 35 pt 33334 38 pt 33334 45 pt 33334 48 pt	34234 33	34234 33	34232 85	34433 51	34433 51	34433 48 pt
33157 34	33157 34	33156 13	33392 55	33334 55	33334 55	34235 11	34235 11	34232 53	34433 52	34433 52	34433 48 pt
33157 35	33157 35	33156 13	33398 01	33321 00	33321 00	34235 12	34235 12	34232 54	34433 53	34433 53	34433 48 pt
33157 36	33157 36	33156 13	33398 05	33323 00	33323 00	34235 21	34235 21	34232 56	34433 54	34433 54	34433 48 pt
33157 37	33157 37	33156 13	33398 73	33398 73	33398 85	34235 22	34235 22	34232 58	34433 55	34433 55	34433 48 pt
33157 38	33157 38	33156 13	33398 99	33398 99	33398 23 33398 98 33399 81	34235 31	34235 31 35533 81	34232 99 pt 35531 85 pt 35532 81 pt	34433 56	34433 56	34433 48 pt
33157 39	33157 39	33156 13	33392 41	33334 41	33334 41	33991 91 33991 98	33991 91 33991 98	33991 99	34433 57	34433 57	34433 48 pt
33157 40	33157 40	33156 13	33392 43	33334 43	33334 45 pt	34234 11	34234 11	34232 31	34433 58	34433 58	34433 48 pt
33157 41	33157 41	33156 13	33392 49	33334 49	33334 48 pt	34234 22	34234 22	34232 83	34433 59	34433 59	34433 48 pt
33157 42	33157 42	33156 13	33392 51	33334 51	33334 35 pt 33334 38 pt 33334 45 pt 33334 48 pt	34234 33	34234 33	34232 85	34433 60	34433 60	34433 48 pt
33157 43	33157 43	33156 13	33392 55	33334 55	33334 55	34235 11	34235 11	34232 53	34433 61	34433 61	34433 48 pt
33157 44	33157 44	33156 13	33398 01	33321 00	33321 00	34235 12	34235 12	34232 54	34433 62	34433 62	34433 48 pt
33157 45	33157 45	33156 13	33398 05	33323 00	33323 00	34235 21	34235 21	34232 56	34433 63	34433 63	34433 48 pt
33157 46	33157 46	33156 13	33398 73	33398 73	33398 85	34235 22	34235 22	34232 58	34433 64	34433 64	34433 48 pt
33157 47	33157 47	33156 13	33398 99	33398 99	33398 23 33398 98 33399 81	34235 31	34235 31 35533 81	34232 99 pt 35531 85 pt 35532 81 pt	34433 65	34433 65	34433 48 pt
33157 48	33157 48	33156 13	33392 41	33334 41	33334 41	33991 91 33991 98	33991 91 33991 98	33991 99	34433 66	34433 66	34433 48 pt
33157 49	33157 49	33156 13	33392 43	33334 43	33334 45 pt	34234 11	34234 11	34232 31	34433 67	34433 67	34433 48 pt
33157 50	33157 50	33156 13	33392 49	33334 49	33334 48 pt	34234 22	34234 22	34232 83	34433 68	34433 68	34433 48 pt
33157 51	33157 51	33156 13	33392 51	33334 51	33334 35 pt 33334 38 pt 33334 45 pt 33334 48 pt	34234 33	34234 33	34232 85	34433 69	34433 69	34433 48 pt
33157 52	33157 52	33156 13	33392 55	33334 55	33334 55	34235 11	34235 11	34232 53	34433 70	34433 70	34433 48 pt
33157 53	33157 53	33156 13	33398 01	33321 00	33321 00	34235 12	34235 12	34232 54	34433 71	34433 71	34433 48 pt
33157 54	33157 54	33156 13	33398 05	33323 00	33323 00	34235 21	34235 21	34232 56	34433 72	34433 72	34433 48 pt
33157 55	33157 55	33156 13	33398 73	33398 73	33398 85	34235 22	34235 22	34232 58	34433 73	34433 73	34433 48 pt
33157 56	33157 56	33156 13	33398 99	33398 99	33398 23 33398 98 33399 81	34235 31	34235 31 35533 81	34232 99 pt 35531 85 pt 35532 81 pt	34433 74	34433 74	34433 48 pt
33157 57	33157 57	33156 13	33392 41	33334 41	33334 41	33991 91 33991 98	33991 91 33991 98	33991 99	34433 75	34433 75	34433 48 pt
33157 58	33157 58	33156 13	33392 43	33334 43	33334 45 pt	34234 11	34234 11	34232 31	34433 76	34433 76	34433 48 pt
33157 59	33157 59	33156 13	33392 49	33334 49	33334 48 pt	34234 22	34234 22	34232 83	34433 77	34433 77	34433 48 pt
33157 60	33157 60	33156 13	33392 51	33334 51	33334 45 pt 33334 53 pt	34234 33	34234 33	34232 85	34433 78	34433 78	34433 48 pt
33157 61	33157 61	33156 13	33392 55	33334 55	33334 55	34235 11	34235 11	34232 53			

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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
34434 17	34434 17	34434 12 pt	34463 12	34463 12	34460 46	34913 35	3494A 45	3494A 45	34931 57	34931 57	34931 56 34931 58
34434 19	34434 19	34434 18 pt	34463 20 34463 22	34463 20 34463 22	34460 49	34913 47	3494A 46	3494A 46	34931 99	34931 99	34931 63 34931 98
34435 21	34435 21	34435 20	34464 10	34464 10	34460 54 pt 34460 56 pt	34913 59	3494A 47	3494A 47	34932 10	34932 10	34932 00
34435 23	34435 23		34464 13	34464 13	34460 54 pt 34460 56 pt	34913 61	3494A 49	3494A 49	34932 20	34932 20	
34435 31	34435 31	34435 35				34914 11	3494A 51	3494A 51	34944 21	34944 21	34944 11
34435 33	34435 33					34914 13	3494A 52	3494A 52	34944 31	34944 31	34944 19
34435 37	34435 37	34435 38	34464 16	34464 16	34460 54 pt 34460 56 pt	34914 15	3494A 53	3494A 53	34944 41	34944 41	
34435 39	34435 39		34464 18	34464 18	34460 54 pt 34460 56 pt	34914 17	3494A 54	3494A 54	34944 51	34944 51	
34438 03	34438 03	34438 04	34465 10	34465 10	34460 54 pt	34914 21	3494A 55	3494A 55	34944 99	34944 99	
34438 05	34438 05		34465 12	34465 12	34460 56 pt	34914 23	3494A 56	3494A 56	34945 12	34945 12	34945 98
34438 14	34438 14	34438 15	34465 30	34465 30	34460 62	34914 25	3494A 57	3494A 57	34945 14	34945 14	
34438 16	34438 16		34482 11	34482 11	34482 17 34482 27	34914 31	3494A 58	3494A 58	34945 16	34945 16	
34438 17	34438 17	34438 18	34625 11	34625 11	34625 00	34914 61	3494A 59	3494A 59	34945 17	34945 17	
34438 19	34438 19		34625 13	34625 13		34915 11	3494A 61	3494A 61	34945 99	34945 99	
34439 15	34439 15	34439 21	34625 15	34625 15	34625 00	34915 23	3494A 63	3494A 63	34961 22	34961 22	34961 21
34439 17	34439 17		34625 17	34625 17		34915 47	3494A 67	3494A 67	34961 31	34961 31	
34439 19	34439 19		34626 11	34626 11	34626 00	34915 59	3494A 65	3494A 65	34964 41	34964 41	34964 31 pt
34439 31	34439 31	34439 30	34626 13	34626 13		34915 61	3494A 65	3494A 65	34964 61 pt	34964 61 pt	
34439 32	34439 32		34626 15	34626 15		34915 63	3494A 66	3494A 66	34964 71 pt	34964 71 pt	
34439 33	34439 33		34626 17	34626 17		34915 65	3494A 67	3494A 67	34964 99 pt	34964 99 pt	
34439 34	34439 34		34627 11	34627 11	34627 00	34915 67	3494A 68	3494A 68			
34439 51	34439 51	34439 56	34627 13	34627 13		34915 69	3494A 69	3494A 69			
34439 53	34439 53		34627 15	34627 15		34915 71	3494A 70	3494A 70			
34441 21	34441 21	34446 37	34627 17	34627 17		34915 73	3494A 72	3494A 72			
34441 23	34441 23	34446 36	34627 19	34627 19		34915 75	3494A 73	3494A 73			
34441 27	34441 27	34446 34	34627 21	34627 21		34915 77	3494A 74	3494A 74			
34441 29	34441 29	34446 32	34628 11	34628 11	34628 00	34915 79	3494A 75	3494A 75			
34443 11	34443 11	34446 21	34628 13	34628 13		34916 23	3494A 76	3494A 76			
34443 13	34443 13		34628 15	34628 15		34916 31	3494A 77	3494A 77			
34443 21	34443 21	34446 25	34628 17	34628 17		34916 33	3494A 78	3494A 78			
34443 23	34443 23		34629 20	34629 20	34629 99	34916 41	3494A 79	3494A 79			
34447 21	34447 21	34446 47	34629 88	34629 88		34916 53	3494A 80	3494A 80			
34447 25	34447 25	34446 46	34629 98	34629 98		34916 55	3494A 81	3494A 81			
34447 31	34447 31	34446 11	34696 00	34696 00	34699 99	34916 57	3494A 82	3494A 82			
34447 41	34447 41	34446 51	34699 98	34699 98		34916 59	3494A 83	3494A 83			
34448 11	34448 11	34446 62 pt	34790 10	34790 10	34790 19	34916 61	3494A 84	3494A 84			
34448 13	34448 13	34446 64 pt	34790 11	34790 11		34916 63	3494A 85	3494A 85			
34448 19	34448 19		34790 21	34790 21		34916 65	3494A 86	3494A 86			
34449 31	34449 31	34446 15	34790 73	34790 73	34790 71	34916 67	3494A 87	3494A 87			
34449 41	34449 41	34446 62 pt	34790 75	34790 75		34916 69	3494A 88	3494A 88			
34449 53	34449 53	34446 44	34911 11	34911 11	3494A 11	34916 71	3494A 89	3494A 89			
34449 55	34449 55	34446 42	34911 13	34911 13	3494A 13	34916 73	3494A 90	3494A 90			
34449 62	34449 62	34446 62 pt	34911 15	34911 15	3494A 15	34916 75	3494A 91	3494A 91			
34449 65	34449 65	34446 64 pt	34911 52	34911 52	3494A 19	34916 77	3494A 92	3494A 92			
34449 98	34449 98	34446 98	34912 01	34912 01	3494A 21	34916 79	3494A 93	3494A 93			
34461 10	34461 10	34460 07	34912 11	34912 11	3494A 22	34916 80	3494A 94	3494A 94			
34461 12	34461 12	34460 09	34912 21	34912 21	3494A 23	34916 82	3494A 95	3494A 95			
34461 15	34461 15	34460 12	34912 23	34912 23	3494A 24	34916 84	3494A 96	3494A 96			
34461 17	34461 17	34460 17	34912 31	34912 31	3494A 25	34916 86	3494A 97	3494A 97			
34462 10	34462 10	34460 31	34912 35	34912 35	3494A 26	34916 88	3494A 98	3494A 98			
34462 12	34462 12	34460 36	34912 41	34912 41	3494A 27	34916 90	3494A 99	3494A 99			
34462 22	34462 22	34460 22	34912 43	34912 43	3494A 29	34916 92	3494A 100	3494A 100			
34462 26	34462 26	34460 51	34913 11	34913 11	3494A 39	34916 94	3494A 101	3494A 101			
34463 10	34463 10	34460 41	34913 23	34913 23	3494A 43	34916 96	3494A 102	3494A 102			

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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
35112 74	35112 74	35112 75 pt	3531E 00	3531E 00	35314 00 pt	35337 22 35337 23	35337 22 35337 23	35331 41	35364 03	35364 03	35362 09 35362 15 pt
35112 76	35112 76	35112 75 pt 35112 77	3531F 00	3531F 00	35316 00	35337 24 35337 25	35337 24 35337 25	35331 46	35364 04	35364 04	35362 11 35362 15 pt
35112 79	35112 79	35112 00 pt	3531G 00	3531G 00	35318 00 pt	35337 26	35337 26	35331 43	35364 05	35364 05	35362 13 35362 15 pt
35112 83	35112 83		3531H 00	3531H 00	35313 00 pt 35318 00 pt 35319 85	35337 27	35337 27		35364 06	35364 06	35362 14 35362 15 pt
35199 01	35199 01	35199 98 pt	3531K 06	3531K 06	35319 06	35337 44	35337 44	35331 44	35364 17	35364 17	35362 55 pt
35199 33	35199 26	35199 26	3531K 07	3531K 07	35319 07	35337 47	35337 47	35331 47	35364 52	35364 52	35362 52
35199 41	35199 41	35199 03	3531K 11	3531K 11	35319 11	35337 48	35337 48	35331 48	35364 54	35364 54	35362 55 pt
35199 42	35199 42		3531K 20	3531K 20	35319 20	35337 59	35337 59	35331 59	35373 01	35373 01	35371 23 pt
35199 43	35199 43	35199 04	3531K 21	3531K 21	35319 21	35337 61	35337 61	35332 61 pt	35373 02	35373 02	
35199 44	35199 44		3531K 22	3531K 22	35319 23	35338 31	35338 31	35332 31	35373 03	35373 03	35371 11 pt
35199 45	35199 45	35199 05	3531K 24	3531K 24		35338 51	35338 51	35332 51	35373 05	35373 05	35371 36 pt 35371 37 pt 35371 38 pt
35199 46	35199 46		3531K 25	3531K 25	35319 25	35338 55	35338 55	35332 55			
35199 47	35199 47	35199 06 pt 35199 07 pt	3531K 27	3531K 27	35319 27	35338 98	35338 98	35332 98	35373 06	35373 06	35371 36 pt 35371 37 pt 35371 38 pt
35199 48	35199 48	35199 06 pt 35199 07 pt	3531K 53	3531K 53	35319 52	35338 99	35338 99	35332 61 pt	35373 08	35373 08	35371 11 pt
35199 51	35199 51	35199 14	3531K 55	3531K 55		35339 12	35339 12	35333 12	35373 12	35373 12	35371 61
35199 52	35199 52		3531K 61	35363 36	35361 36	35339 13	35339 13	35333 13	35373 15	35373 15	35371 23 pt 35371 41 pt
35199 53	35199 53	35199 15	3531K 70	3531K 70	35319 70	35339 14	35339 14	35333 14	35373 16	35373 16	35371 11 pt
35199 55	35199 55	35199 16	3531K 74	3531K 74	35319 72 35319 73	35339 19	35339 19	35333 19	35373 17	35373 17	35371 36 pt 35371 37 pt 35371 38 pt 35371 41 pt
35199 56	35199 56		3531K 77	3531K 77	35319 75 35319 76	35339 21	35339 21	35333 21			
35199 57	35199 57	35199 17	3531K 82	3531K 82	35319 82	35339 53	35339 53	35333 53	35373 18	35373 18	35371 11 pt
35199 58	35199 58		3531K 90	3531K 40	35319 41 35371 91 35371 93	35339 55	35339 55	35333 55	35373 19	35373 19	35371 65
35199 59	35199 59	35199 18	3531K 97	3531K 97	35319 97	35339 57	35339 57	35333 57	35373 21	35373 21	35371 55
35199 60	35199 60		3531M 01	3531M 01	35313 00 pt	35339 65	35339 65	35333 65	35373 25	35373 25	35371 99 pt
35199 61	35199 61	35199 19	3531M 03	3531M 03	35314 00 pt	35339 71	35339 71	35333 71	35373 26	35373 26	35371 75
35199 62	35199 62		3531M 05	3531M 05	35319 84 pt 35319 86 pt	35339 82	35339 82	35333 82	35373 28	35373 28	35371 81
35199 91	35199 91	35199 22 pt 35199 23 pt 35199 28 pt 35199 29 pt 35199 98 pt	3531M 07	3531M 07	35319 84 pt 35319 86 pt	35339 98	35339 98	35333 98	35373 29	35373 29	35371 83
35199 92	35199 92	35199 22 pt 35199 23 pt 35199 28 pt 35199 29 pt 35199 98 pt	3531M 09	3531M 09	35319 84 pt 35319 86 pt	3533A 10	3533A 10	35335 10	35373 31	35373 31	35371 71
35239 26	35239 26	35239 21 35239 25	3531M 15	3531M 19	35319 84 pt 35319 86 pt 35374 15	3533B 21	3533B 21	35336 21	35373 32	35373 32	35371 85
35239 31	35239 31	35239 01 35239 02 35239 03 35239 04 35239 05 35239 06 35239 07 35239 08 35239 09 35239 11 35239 12 35239 19 35239 30	35329 33	35329 33	35329 31 pt 35329 35 pt	3533B 32 3533B 34	3533B 32 3533B 34	35336 31	35373 35	35373 35	35362 41
35239 53	35239 53	35239 50 35239 51	35329 34	35329 34	35329 31 pt 35329 35 pt	35363 01	35363 01	35361 11	35373 39	35373 39	35371 48 35371 99 pt
3523C 00	3523C 00	35234 00 pt 35237 00 pt 35238 00 pt	35337 11	35337 11	35331 11	35363 13	35363 13	35361 13	35374 17	35374 17	35362 57
3523E 00	3523E 00	35234 00 pt 35238 00 pt	35337 12	35337 12	35331 12	35363 15	35363 15	35361 14	35374 19	35374 19	35372 85 pt
3523F 00	3523F 00	3523A 00 3523B 00	35337 14	35337 14	35331 14	35363 16	35363 16	35361 16	35419 21	35419 21	35419 41
35246 00	35246 00	35243 00 35245 00	35337 15	35337 15	35331 15	35363 37 35363 38	35363 37 35363 38	35361 39 pt	35419 22	35419 22	
3531A 00	3531A 00	35311 00	35337 16	35337 16	35331 16	35364 01	35364 01	35362 07 35362 15 pt	35419 23	35419 23	
3531B 00	3531B 00	35312 00	35337 17	35337 17	35331 17	35364 02	35364 02	35362 08 35362 15 pt	35419 24	35419 24	
3531C 00	3531C 00	35317 10 35317 20 35317 30	35337 21	35337 21	35331 21	35364 05	35364 05		35419 25	35419 25	
						35420 11	35420 11		35419 26	35419 26	
						35421 00	35421 00		35419 27	35419 27	
						35422 00	35422 00		35419 28	35419 28	
						35423 00	35423 00		35419 29	35419 29	
						35424 00	35424 00		35419 30	35419 30	
						35425 00	35425 00		35419 31	35419 31	
						35426 00	35426 00		35419 32	35419 32	
						35427 00	35427 00		35419 33	35419 33	
						35428 00	35428 00		35419 34	35419 34	
						35429 00	35429 00		35419 35	35419 35	
						35430 00	35430 00		35419 36	35419 36	
						35431 00	35431 00		35419 37	35419 37	
						35432 00	35432 00		35419 38	35419 38	
						35433 00	35433 00		35419 39	35419 39	
						35434 00	35434 00		35419 40	35419 40	
						35435 00	35435 00		35419 41	35419 41	
						35436 00	35436 00		35419 42	35419 42	
						35437 00	35437 00		35419 43	35419 43	
						35438 00	35438 00		35419 44	35419 44	
						35439 00	35439 00		35419 45	35419 45	
						35440 00	35440 00		35419 46	35419 46	
						35441 00	35441 00		35419 47	35419 47	
						35442 00	35442 00		35419 48	35419 48	
						35443 00	35443 00		35419 49	35419 49	
						35444 00	35444 00		35419 50	35419 50	
						35445 00	35445 00		35419 51	35419 51	
						35446 00	35446 00		35419 52	35419 52	
						35447 00	35447 00		35419 53	35419 53	
						35448 00	35448 00		35419 54	35419 54	
						35449 00	35449 00		35419 55	35419 55	
						35450 00	35450 00		35419 56	35419 56	
						35451 00	35451 00		35419 57	35419 57	
						35452 00	35452 00		35419 58	35419 58	
						35453 00	35453 00		35419 59	35419 59	
						35454 00	35454 00		35419 60	35419 60	
						35455 00	35455 00		35419 61	35419 61	
						35456 00	35456 00		35419 62	35419 62	
						35457 00	35457 00		35419 63	35419 63	
						35458 00	35458 00		35419 64	35419 64	
						35459 00	35459 00		35419 65	35419 65	
						35460 00	35460 00		35419 66	35419 66	
						35461 00	35461 00		35419 67	35419 67	
						35462 00	35462 00		35419 68	35419 68	
						35463 00	35463 00		35419 69	35419 69	
						35464 00	35464 00		35419 70	35419 70	
						35465 00	35465 00		35419 71	35419 71	
						35466 00	35466 00		35419 72	35419 72	
						35467 00	35467 00		35419 73	35419 73	
						35468 00	35468 00		35419 74	35419 74	
						35469 00	35469 00		35419 75	35419 75	
						35470 00	35470 00		35419 76	35419 76	
						35471 00	35471 00		35419 77	35419 77	
						35472 00	35472 00		35419 78	35419 78	
						35473 00	35473 00		35419 79	3541	

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35430 98	35650 98	35650 98	35462 72	35462 72	35462 73 35462 74 35462 75 35462 76 35462 77 35462 78	35484 09	35496 19	35496 19	35543 03	35543 03	35541 28 pt 35542 73 pt
35441 23	35441 23	35441 29				35485 01	35497 61	35497 61	35543 04	35543 04	35541 25 35542 73 pt
35441 25	35441 25					35485 02	35497 65	35497 65			
35441 42	35441 42	35441 91				35485 03	35497 67	35497 67	35543 05	35543 05	35541 28 pt 35542 73 pt
35441 44	35441 44					35485 04	35497 73	35497 73			
35441 83	35441 83		35463 12	35463 12	35462 19	35485 05	35497 74	35497 63 35497 75	35543 09	35543 09	35541 31 35542 73 pt
35441 89	35441 89		35463 14	35463 14		35485 07	35495 55	35495 55	35543 11	35543 11	35541 49 pt 35542 73 pt
35442 15	35442 15	35442 21 35442 25 pt	35473 48	35473 48	35473 56	35485 09	35497 81	35497 81	35543 12	35543 12	35541 49 pt 35542 73 pt
35442 16	35442 16	35442 25 pt	35473 51	35473 51		35485 10	35495 13	35492 13 35492 18	35543 13	35543 13	35541 45 35542 73 pt
35442 17	35442 17	35442 62 pt	35473 52	35473 52		35485 11	35495 55	35495 55			
35442 18	35442 18		35481 01	36231 14	36231 14	35485 12	35497 81	35497 81	35543 14	35543 14	35541 49 pt 35542 73 pt
35442 19	35442 19		35481 02	36231 16	36231 16	35485 13	35497 81	35497 81	35543 15	35543 15	35541 49 pt 35542 73 pt
35442 23	35442 23		35481 03	36231 31	36231 31	35485 14	35497 81	35497 81	35543 16	35543 16	35541 49 pt 35542 73 pt
35442 41	35442 41	35442 33	35481 04	36231 32	36231 32	35485 15	35495 01	35495 01	35543 17	35543 17	35541 45 35542 73 pt
35442 42	35442 42		35481 05	36231 33	36231 33	35485 16	35495 02	35495 02	35543 18	35543 18	35541 49 pt 35542 73 pt
35442 45	35442 45	35442 62 pt	35481 06	36231 35	36231 35	35485 17	35495 03	35495 03	35543 19	35543 19	35541 49 pt 35542 73 pt
35442 47	35442 47		35481 07	36231 52	36231 52	35485 18	35495 92	35495 92	35543 20	35543 20	35541 49 pt 35542 73 pt
35442 67	35442 67		35481 08	36231 53	36231 53	35485 19	35495 95	35495 95	35543 21	35543 21	35541 49 pt 35542 73 pt
35451 53	35451 53	35451 43 35451 44	35481 09	36231 54	36231 54	35485 20	35521 38	35521 38	35543 22	35543 22	35541 51 35542 73 pt
35451 54	35451 54	35451 48 35451 49	35481 10	36231 55	36231 55	35485 21	35521 39	35521 39	35543 23	35543 23	35541 53 35542 73 pt
35454 12	35454 12	35453 12	35481 11	36231 56	36231 56	35485 22	35521 40	35521 40	35543 24	35543 24	35541 54 pt 35542 73 pt
35454 14	35454 14	35453 14	35481 12	36231 57	36231 57	35485 23	35521 41	35521 41	35543 25	35543 25	35541 54 pt 35542 73 pt
35454 17	35454 17	35453 17	35481 13	36231 59	36231 59	35485 24	35521 68	35521 68	35543 26	35543 26	35541 54 pt 35542 73 pt
35454 31	35454 31	35453 31	35482 01	36232 01	36232 41	35485 25	35521 69	35521 69	35543 27	35543 27	35541 54 pt 35542 73 pt
35454 37	35454 37	35453 37	35482 02	36232 02		35485 26	35521 84	35521 84	35543 28	35543 28	35541 54 pt 35542 73 pt
35454 38	35454 38	35453 38	35482 03	36232 11	36232 11	35485 27	35522 79	35522 79	35543 29	35543 29	35541 54 pt 35542 73 pt
35454 41	35454 41	35453 41	35482 04	36232 23	36232 23	35485 28	35533 11	35533 11	35543 30	35543 30	35541 54 pt 35542 73 pt
35454 43	35454 43	35453 43	35482 05	36232 25	36232 25	35485 29	35533 13	35533 13	35543 31	35543 31	35541 54 pt 35542 73 pt
35454 45	35454 45	35453 45	35482 06	36232 31	36232 31	35485 30	35533 15	35533 15	35543 32	35543 32	35541 54 pt 35542 73 pt
35454 51	35454 51	35453 51	35482 07	36232 43	36232 59 pt 36232 64 pt	35485 31	35533 19	35533 19	35543 33	35543 33	35541 54 pt 35542 73 pt
35454 59	35454 59	35453 59	35482 08	36232 45	36232 59 pt 36232 64 pt 36232 68 pt	35485 32	35533 21	35533 21	35543 34	35543 34	35541 54 pt 35542 73 pt
35454 98	35454 98	35453 98	35482 09	36232 46	36232 61	35485 33	35533 23	35533 23	35543 35	35543 35	35541 54 pt 35542 73 pt
35455 11	35455 11	35452 11	35482 11	36232 52	36232 52	35485 34	35533 25	35533 25	35543 36	35543 36	35541 54 pt 35542 73 pt
35455 13	35455 13	35452 13	35482 12	36232 54	36232 54	35485 35	35533 29	35533 29	35543 37	35543 37	35541 54 pt 35542 73 pt
35455 15	35455 15	35452 15	35482 13	36232 55	36232 55	35485 36	35533 31	35533 31	35543 38	35543 38	35541 54 pt 35542 73 pt
35455 17	35455 17	35452 17	35482 14	36232 58	36232 58	35485 37	35533 33	35533 33	35543 39	35543 39	35541 54 pt 35542 73 pt
35455 21	35455 21	35452 21	35482 15	36232 62	36232 61	35485 38	35533 35	35533 35	35543 40	35543 40	35541 54 pt 35542 73 pt
35455 61	35455 61	35452 61	35482 16	36232 66	36232 64 pt 36232 68 pt	35485 39	35533 39	35533 39	35543 41	35543 41	35541 54 pt 35542 73 pt
35455 65	35455 65	35452 65	35483 05	36233 13	36233 13	35485 40	35533 41	35533 41	35543 42	35543 42	35541 54 pt 35542 73 pt
35455 71	35455 71	35452 71	35483 06	36233 23	36233 23	35485 41	35533 43	35533 43	35543 43	35543 43	35541 54 pt 35542 73 pt
35455 81	35455 81	35452 99 pt	35483 07	36233 31	36233 31	35485 42	35533 45	35533 45	35543 44	35543 44	35541 54 pt 35542 73 pt
35455 83	35455 83		35483 08	36233 52	36233 52	35485 43	35533 47	35533 47	35543 45	35543 45	35541 54 pt 35542 73 pt
35455 91	35455 91	35452 92	35483 09	36233 61	36233 61	35485 44	35533 49	35533 49	35543 46	35543 46	35541 54 pt 35542 73 pt
35455 92	35455 92					35485 45	35533 51	35533 51	35543 47	35543 47	35541 54 pt 35542 73 pt
35455 93	35455 93	35452 99 pt	35483 10	36233 61	36233 61	35485 46	35533 53	35533 53	35543 48	35543 48	35541 54 pt 35542 73 pt
35455 94	35455 94	35452 94	35483 11	36233 71	36233 71	35485 47	35533 55	35533 55	35543 49	35543 49	35541 54 pt 35542 73 pt
35455 95	35455 95	35452 95	35483 12	36233 81	36233 81	35485 48	35533 57	35533 57	35543 50	35543 50	35541 54 pt 35542 73 pt
35455 96	35455 96	35452 99 pt	35483 13	36233 81	36233 81	35485 49	35533 59	35533 59	35543 51	35543 51	35541 54 pt 35542 73 pt
35455 97	35455 97		35483 14	36233 81	36233 81	35485 50	35533 61	35533 61	35543 52	35543 52	35541 54 pt 35542 73 pt
35455 98	35455 98					35485 51	35533 63	35533 63	35543 53	35543 53	35541 54 pt 35542 73 pt
35456 42	35456 42	35462 43	35484 02	35496 05	35496 05	35485 52	35533 65	35533 65	35543 54	35543 54	35541 54 pt 35542 73 pt
35456 44	35456 44	35462 44	35484 03	35496 09	35496 09	35485 53	35533 67	35533 67	35543 55	35543 55	35541 54 pt 35542 73 pt
35456 47	35456 47	35462 45	35484 04	35496 15	35496 15	35485 54	35533 69	35533 69	35543 56	35543 56	35541 54 pt 35542 73 pt
35456 49	35456 49		35484 05	35496 17	35496 17	35485 55	35533 71	35533 71	35543 57	35543 57	35541 54 pt 35542 73 pt

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35561 07	35511 07	35511 91	35593 01	35593 11	35593 11	35599 13	35599 13	35595 41 pt 35595 98 pt	35616 00	35616 00	3561C 00
35561 08	35511 08	35511 99 pt	35593 03	35593 31	35593 31	35599 15	35599 15	35595 41 pt 35595 98 pt	35645 46 35645 47	35645 46 35645 47	35645 49
35561 09	35511 09	35511 41 pt	35593 05	35593 32	35593 32	35599 17	35599 17	35595 41 pt 35595 98 pt	35646 10 35646 20	35646 10 35646 20	35646 00
35561 11	35511 11	35511 99 pt	35593 07	35593 34	35593 34	35599 19	35599 19	35595 41 pt 35595 98 pt	35651 01	35514 15 35691 15	35514 15 35691 15
35561 19	35511 19	35511 21	35593 09	35593 35	35593 35	35599 22	35599 22	35595 41 pt 35595 98 pt	35651 02	35514 22 35691 22	35514 22 35691 22
35561 21	35511 21	35512 11	35593 11	35593 52	35593 52	35599 25	35599 25	35595 41 pt 35595 98 pt	35651 03	35514 26 35691 26	35514 26 35691 26
35562 11	35512 11	35512 21	35593 13	35593 13	35593 53 35593 54	35599 27	35599 27	35595 41 pt	35651 04	35514 29 35691 29	35514 29 35691 29
35562 21	35512 21	35512 21	35593 15	35593 61	35593 61	35599 31	35599 31	35595 45	35651 05	35514 30 35691 30	35514 30 35691 30
35562 31	35512 31	35512 31	35593 17	35593 71	35593 71	35599 33	35599 33	35595 45	35651 06	35514 32 35691 32	35514 32 35691 32
35562 41	35512 41	35512 41	35593 19	35593 72	35593 72	35599 35	35599 35	35595 49	35651 07	35514 33 35691 33	35514 33 35691 33
35562 51	35512 51	35512 51	35593 21	35593 21	35593 79	35599 37	35599 37	35595 49	35651 08	35514 35 35691 35	35514 35 35691 35
35562 65	35512 65	35512 61 35512 92 pt	35593 23	35593 23	35593 79	35599 39	35599 39	35595 43	35651 09	35514 41 35691 41	35514 41 35691 41
35562 71	35512 71	35512 71	35593 25	35593 25	35593 81	35599 41	35599 41	35595 43	35651 10	35514 52 35691 52	35514 52 35691 52
35562 75	35512 75	35512 75	35593 27	35593 27	35593 81	35599 43	35599 43	35595 48 pt	35651 11	35514 52 35691 52	35514 52 35691 52
35562 85	35512 85	35512 92 pt	35593 29	35593 29	35593 81	35599 45	35599 45	35595 52	35651 12	35514 53 35691 53	35514 53 35691 53
35562 91	35512 91	35512 87 35512 92 pt	35594 01	35594 11	35594 11	35599 47	35599 47	35595 85 pt	35651 13	35514 54 35691 54	35514 54 35691 54
35563 01	35513 01	35513 59 pt	35594 03	35594 31	35594 31	35599 49	35599 49	35595 98 pt	35651 14	35514 55 35691 55	35514 55 35691 55
35563 02	35513 02	35513 39	35594 05	35594 51	35594 51	35599 51	35599 51	35595 98 pt	35651 15	35514 63 35691 63	35514 63 35691 63
35563 03	35513 03	35513 59 pt	35594 09	35594 09	35594 79	35599 53	35599 53	35595 73	35651 16	35514 71 35691 71	35514 71 35691 71
35563 04	35513 04	35513 04	35594 13	35594 15	35594 15	35599 55	35599 55	35595 73	35651 17	35514 81 35691 81	35514 81 35691 81
35563 05	35513 05	35513 23 pt 35513 59 pt	35594 17	35594 17	35594 81	35599 57	35599 57	35595 92	35651 18	35514 82 35691 82	35514 82 35691 82
35563 06	35513 06	35513 52 35513 59 pt	35594 19	35594 19	35594 21	35599 59	35599 59	35595 92	35651 19	35514 83 35691 83	35514 83 35691 83
35563 07	35513 07	35513 59 pt	35596 01	35596 01	35595 95	35599 61	35599 61	35595 96	35651 20	35514 84 35691 84	35514 84 35691 84 pt
35563 08	35513 08	35513 49	35596 03	35596 03	35595 95	35599 63	35599 63	35595 96	35651 21	35514 84 35691 84	35514 84 35691 84 pt
35563 09	35513 09	35513 59 pt	35596 05	35596 05	35595 95	35599 65	35599 65	35595 82 pt	35651 22	35514 88 35691 88	35514 88 35691 88
35563 11	35513 11	35513 13	35596 07	35596 07	35595 95	35599 67	35599 67	35595 86 pt	35651 23	35514 88 35691 88	35514 88 35691 88
35563 12	35513 12	35513 23 pt 35513 59 pt	35596 11	35596 11	35595 95	35599 69	35599 69	35595 86 pt	35651 24	35514 88 35691 88	35514 88 35691 88
35563 14	35513 14	35513 59 pt	35596 13	35596 13	35595 95	35599 71	35599 71	35595 82 pt	35651 25	35514 88 35691 88	35514 88 35691 88
35563 15	35513 15	35513 29 35513 59 pt	35596 15	35596 15	35595 95	35599 73	35599 73	35595 87	35651 26	35514 88 35691 88	35514 88 35691 88
35563 21	35513 21	35513 83 pt	35596 17	35596 17	35595 95	35599 75	35599 75	35595 87	35651 27	35514 88 35691 88	35514 88 35691 88
35591 01	35591 01	35591 00 pt	35596 19	35596 19	35595 95	35599 77	35599 77	35595 94	35651 28	35514 88 35691 88	35514 88 35691 88
35591 03	35591 03	35591 03	35596 21	35596 21	35595 95	35599 80	35599 80	35595 98 pt	35651 29	35514 88 35691 88	35514 88 35691 88
35591 05	35591 05	35591 05	35596 23	35596 23	35595 95	35599 81	35599 81	35595 98 pt	35652 00	35514 91 35691 91	35514 91 35691 91
35591 07	35591 07	35591 00 pt	35596 25	35596 25	35595 95	35599 82	35599 82	35595 62 pt	35674 01	35674 01	35674 11 pt
35591 09	35591 09	35591 00 pt	35596 27	35596 27	35595 95	35599 83	35599 83	35595 98 pt	35674 02	35674 02	35674 17
35591 11	35591 11	35591 11	35596 29	35596 29	35595 95	35599 85	35599 85	35595 62 pt 35595 98 pt	35674 03	35674 03	35674 19 pt
35591 13	35591 13	35591 00 pt	35596 31	35596 31	35595 95	35599 88	35599 88	36362 74	35674 04	35674 04	35674 11 pt
35591 15	35591 15	35591 00 pt	35596 33	35596 33	35595 95	35599 89	35599 89	36362 75	35674 05	35674 05	35674 31 pt
35592 01	35592 21	35592 21	35596 35	35596 35	35595 95	35599 90	35599 90	36362 85	35675 01	35675 01	35675 51
35592 03	35592 33	35592 33	35596 37	35596 37	35595 95	35599 92	35599 92	35595 98 pt	35675 02	35675 02	35675 59
35592 05	35592 35	35592 35	35596 39	35596 39	35595 95	35599 93	35599 93	35595 98 pt	35675 03	35675 03	35675 59
35592 07	35592 54	35592 54	35596 41	35596 41	35595 95	35599 94	35599 94	35595 98 pt	35675 11	35675 11	35675 91
35592 09	35592 09	35592 98 pt	35596 43	35596 43	35595 95	35599 95	35599 95	35595 98 pt	35675 12	35675 12	35675 91
35592 11	35592 11	35592 11	35596 45	35596 45	35595 95	35599 96	35599 96	35595 98 pt	35676 00	35676 00	35676 00 pt
35592 15	35592 15	35592 41 35592 42 35592 98 pt	35596 47	35596 47	35595 97	35599 97	35599 97	35595 98 pt	35676 01	35676 01	35676 11
35592 19	35592 97	35592 97	35596 49	35596 49	35595 97	35599 99	35599 99	35595 88 35595 98 pt	35676 02	35676 02	35676 11

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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
35676 02	35676 02	35672 21	35751 00	35732 40 36612 10	35732 00 pt 36612 00 pt	35892 98	35892 98	35892 89 pt	35963 03	35763 03	35760 62
35676 03	35676 03	35672 61				35892 99	35892 99	35892 93 pt	35963 05	35763 05	35760 63
35676 04	35676 04	35672 00 pt	35752 00	35733 40	35734 30 pt 35735 51 pt	35893 01	35893 01	35893 11	35963 09	35763 09	35760 84
35676 05	35676 05	35672 41 pt	35771 00	35732 30 35732 61	35732 00 pt	35893 08	35893 08	35893 98	36122 02	36122 02	36122 00
35676 06	35676 06	35672 00 pt				35893 09	35893 09		36122 04	36122 04	
35676 17	35676 17	35672 41 pt	35772 00	35733 30	35734 30 pt 35735 51 pt	35921 01	35921 01	35921 11	36122 06	36122 06	
35676 19	35676 19	35676 19		35733 60	35734 30 pt 35735 51 pt	35921 02	35921 02	35921 13	36122 14	36122 14	
35681 11	35681 11	35681 15	35781 00	35743 00	35743 00	35921 03	35921 03	35921 71	36122 16	36122 16	
35681 13	35681 13	35681 13							36122 19	36122 19	
35683 36	35683 36	35683 99 pt	35782 00	35744 00	35744 00	35921 05	35921 05	35921 72	36122 21	36122 21	
35683 93	35683 93	35683 95	35783 00	35745 00	35745 10 35745 31	35922 01	35922 01	35922 21	36122 23	36122 23	
35683 95	35683 95	35683 95				35922 02	35922 02	35922 23	36122 28	36122 28	
35683 98	35683 98	35683 91 35683 99 pt	3579A 00	3579A 00	3579A 20 3579A 40 3579A 41 3579A 44 3579A 50 3579A 55	35922 03	35922 03	35922 51	36122 29	36122 29	
35692 00	35692 00	35694 00 35695 00 35696 00				35922 04	35922 04	35922 53	36123 01	36123 01	36125 00 pt
35693 04	35693 04	35693 01 pt 35693 02 pt 35693 03 pt	35820 35 35820 36	35820 35 35820 36	35820 24	35922 05	35922 05	35922 55	36123 02	36123 02	
35693 05	35693 05	35693 01 pt 35693 02 pt 35693 03 pt	35856 00	35856 00	35856 11 35856 30	35922 06	35922 06	35922 57	36123 03	36123 03	
35693 06	35693 06	35693 01 pt 35693 02 pt 35693 03 pt	35859 05 35859 07	35859 05 35859 07	35859 09	35923 01	35923 01	35923 61	36123 04	36123 04	
35697 00	35697 00	35699 97 pt	3585C 00	3585A 10 3585A 20	3585A 10 3585A 20	35923 02	35923 02	35923 63	36123 05	36123 05	
35698 01	35698 01	35699 31	3585D 10	3585B 10	3585B 10	35932 00	35998 00	35998 00	36123 06	36123 06	
35698 02	35698 02	35698 02	3585D 20	3585B 20	3585B 20	35933 00	35999 00	35999 00	36123 07	36123 07	
35698 03	35698 03	35699 32	3585D 30	3585B 30	3585B 30	35941 10	35619 00	35617 00 35618 00	36123 11	36123 11	
35698 04	35698 04	35698 04	3585D 40	3585B 40	3585B 40	35941 20	35631 50	35631 40 pt	36126 01	36126 01	36125 00 pt
35698 05	35698 05	35699 33	3585D 50	3585B 50	3585B 50	35942 10	3561D 00	3561A 00 3561B 00	36126 02	36126 02	
35698 06	35698 06	35698 06	3585D 60	3585B 60	3585B 60	35942 20	35631 60	35631 40 pt	36126 03	36126 03	
35698 07	35698 07	35699 35	3585D 70	3585B 70	3585B 70	35961 01	35761 01	35760 13	36126 04	36126 04	
35698 08	35698 08	35699 35	3585D 80	3585B 72 36994 07	3585B 72 36994 07	35961 03	35761 03	35760 15	36126 05	36126 05	
35698 11	35698 11	35699 36	35892 03	35892 03	35892 01 pt	35961 05	35761 05	35760 21	36126 09	36126 09	
35698 12	35698 12	35699 36	35892 04	35892 04	35892 02 pt	35961 07	35761 07	35760 23	36127 11	36127 11	36127 00
35698 13	35698 13	35699 41	35892 05	35892 05		35961 09	35761 09	35760 24	36127 31	36127 31	
35698 14	35698 14	35699 41	35892 06	35892 06	35892 01 pt 35892 02 pt	35961 11	35761 11	35760 26	36127 78	36127 78	
35698 15	35698 15	35699 43	35892 07	35892 07	35892 93 pt	35961 13	35761 13	35760 28	36221 00	36221 00	
35698 16	35698 16	35699 43	35892 08	35892 08	35892 21 35860 41 35860 88	35961 15	35761 15	35760 22	36223 00	36223 00	
35698 17	35698 17	35699 45	35892 09	35892 09		35961 07	35761 07	35760 23	36224 94	36224 94	36224 98
35698 18	35698 18	35699 45	35892 10	35892 10		35961 09	35761 09	35760 24	36225 00	36225 00	36225 00 pt
35698 21	35698 21	35699 51	35892 11	35892 11		35961 11	35761 11	35760 26	36225 10	36225 10	36225 00 pt
35698 22	35698 22	35699 51	35892 12	35892 12		35961 13	35761 13	35760 28	36225 20	36225 20	36225 00
35698 23	35698 23	35699 61	35892 13	35892 13		35961 15	35761 15	35760 22	36225 30	36225 30	36225 00
35698 24	35698 24	35699 61	35892 14	35892 14		35961 17	35761 17	35760 30	36225 40	36225 40	36225 00
35698 25	35698 25	35699 71	35892 15	35892 15		35962 01	35762 01	35760 32	36225 50	36225 50	36225 00
35698 26	35698 26	35699 71	35892 16	35892 16		35962 03	35762 03	35760 33	36225 60	36225 60	36225 00
35698 27	35698 27	35699 73	35892 17	35892 17		35962 05	35762 05	35760 36	36225 70	36225 70	36225 00
35698 28	35698 28	35699 73	35892 18	35892 18		35962 07	35762 07	35760 37 pt	36225 80	36225 80	36225 00
35698 31	35698 31	35699 74	35892 19	35892 19		35962 09	35762 09	35760 41	36225 90	36225 90	36225 00
35698 32	35698 32	35699 74	35892 20	35892 20		35962 11	35762 11	35760 45	36226 00	36226 00	36226 00
35698 35	35698 35	35699 97 pt	35892 21	35892 21		35962 13	35762 13	35760 52	36226 10	36226 10	36226 00
35698 36	35698 36	35699 97 pt	35892 22	35892 22		35962 15	35762 15	35760 53	36226 20	36226 20	36226 00
35698 48	35698 48	35699 97 pt	35892 23	35892 23		35962 17	35762 17	35760 57 pt	36226 30	36226 30	36226 00
35698 49	35698 49	35699 97 pt	35892 24	35892 24		35962 19	35762 19	35760 57 pt	36226 40	36226 40	36226 00
35711 00	35731 00	35731 00	35892 25	35892 25		35962 21	35762 21	35760 57 pt	36226 50	36226 50	36226 00
	36629 43	36629 43	35892 26	35892 26		35962 23	35762 23	35760 57 pt	36226 60	36226 60	36226 00
35712 00	35733 05	35734 20	35892 27	35892 27		35962 25	35762 25	35760 57 pt	36226 70	36226 70	36226 00
	35735 41	35735 41	35892 28	35892 28		35962 27	35762 27	35760 57 pt	36226 80	36226 80	36226 00
35721 00	35732 10	35732 00 pt	35892 29	35892 29		35962 29	35762 29	35760 57 pt	36226 90	36226 90	36226 00
			35892 30	35892 30		35962 31	35762 31	35760 57 pt	36226 100	36226 100	36226 00
35722 00	35733 10	35734 30 pt	35892 31	35892 31		35962 33	35762 33	35760 57 pt	36226 110	36226 110	36226 00
		35735 51 pt	35892 32	35892 32		35962 35	35762 35	35760 57 pt	36226 120	36226 120	36226 00
			35892 33	35892 33		35962 37	35762 37	35760 57 pt	36226 130	36226 130	36226 00
			35892 34	35892 34		35962 39	35762 39	35760 57 pt	36226 140	36226 140	36226 00
			35892 35	35892 35		35962 41	35762 41	35760 57 pt	36226 150	36226 150	36226 00
			35892 36	35892 36		35962 43	35762 43	35760 57 pt	36226 160	36226 160	36226 00
			35892 37	35892 37		35962 45	35762 45	35760 57 pt	36226 170	36226 170	36226 00
			35892 38	35892 38		35962 47	35762 47	35760 57 pt	36226 180	36226 180	36226 00
			35892 39	35892 39		35962 49	35762 49	35760 57 pt	36226 190	36226 190	36226 00
			35892 40	35892 40		35962 51	35762 51	35760 57 pt	36226 200	36226 200	36226 00
			35892 41	35892 41		35962 53	35762 53	35760 57 pt	36226 210	36226 210	36226 00
			35892 42	35892 42		35962 55	35762 55	35760 57 pt	36226 220	36226 220	36226 00
			35892 43	35892 43		35962 57	35762 57	35760 57 pt	36226 230	36226 230	36226 00
			35892 44	35892 44		35962 59	35762 59	35760 57 pt	36226 240	36226 240	36226 00
			35892 45	35892 45		35962 61	35762 61	35760 57 pt	36226 250	36226 250	36226 00
			35892 46	35892 46		35962 63	35762 63	35760 57 pt	36226 260	36226 260	36226 00
			35892 47	35892 47		35962 65	35762 65	35760 57 pt	36226 270	36226 270	36226 00
			35892 48	35892 48		35962 67	35762 67	35760 57 pt	36226 280	36226 280	36226 00
			35892 49	35892 49		35962 69	35762 69	35760 57 pt	36226 290	36226 290	36226 00
			35892 50	35892 50		35962 71	35762 71	35760 57 pt	36226 300	36226 300	36226 00
			35892 51	35892 51		35962 73	35762 73	35760 57 pt	36226 310	36226 310	36226 00
			35892 52	35892 52		35962 75	35762 75	35760 57 pt	36226 320	3622	

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36395 10	36361 21 36395 30	36361 21 36394 00 pt 36399 60	36920 05— Con.	36920 05— Con.	36920 10 pt —Con. 36920 82 pt 36920 92 pt	37112 02— Con.	37112 02— Con.	37112 23 pt —Con. 37112 26 pt	37131 07	37131 07	37131 60 pt
36395 20	36361 84 36395 40	36361 84 36394 00 pt 36399 91 36399 93		36920 07	36920 07	36920 10 pt 36920 70 pt 36920 82 pt 36920 92 pt	37112 03	37112 03	37112 11 pt 37112 13 pt	37131 11	37131 40
36411 00	36410 10	36410 20 36410 55 36410 63	36920 09	36920 09	36920 95	37112 04	37112 04	37112 11 pt 37112 13 pt 37112 15 pt	37131 13	37131 13	37131 42 37131 46
36412 00	36994 22	36994 11 36994 21		36941 01	36941 01	36941 11	37112 05	37112 05	37112 11 pt 37112 13 pt	37131 15	37131 48
36489 12	36489 12	36489 11 pt 36489 19 pt	36941 03	36941 03	36941 31	37112 06	37112 06	37112 11 pt 37112 13 pt 37112 15 pt	37131 16	37131 50	37131 50
36489 16	36489 16	36489 11 pt	36941 04	36941 04	36941 35		37112 05	37112 05	37112 11 pt 37112 13 pt	37131 17	37131 52
36489 17	36489 17	36489 19 pt	36942 01	36942 01	36942 14 36942 28 pt	37112 07	37112 07	37112 11 pt 37112 13 pt 37112 15 pt	37131 21	37131 37	37131 37
36520 00	36520 00	36521 00 36521 19	36942 02	36942 02	36942 28 pt		37112 07	37112 07	37112 11 pt 37112 13 pt 37112 15 pt	37131 43	37131 30
36520 01	36520 01	36521 01 pt 36521 02 pt	36942 03	36942 03	36942 27 36942 28 pt	37112 08	37112 08	37112 23 pt 37112 25 pt 37112 26 pt	37131 49	37131 49	37131 12 pt 37131 25
36520 03	36520 03	36521 01 pt 36521 02 pt	36942 04	36942 04	36942 37 36942 41 36942 42		37112 09	37112 09	37112 11 pt 37112 13 pt 37112 15 pt	37131 53	37131 33
36520 05	36520 05	36521 03 36521 04	36943 01	36943 01	36943 11 36943 42 pt	37112 09	37112 09	37112 11 pt 37112 13 pt 37112 15 pt	37131 55	37131 34	37131 34
36520 07	36520 07 36520 09	36521 05	36943 02	36943 02	36943 42 pt		37112 08	37112 08	37112 23 pt 37112 25 pt 37112 26 pt	37131 57	37131 54
36520 11	36520 11	36521 12 36521 15	36943 03	36943 03	36943 41 36943 42 pt	37112 31	37112 31	37112 11 pt 37112 13 pt 37112 15 pt	37131 61	37131 36	37131 36
36520 19	36520 19	36521 11 36521 13 36521 14 36521 16	36947 04 36947 05	36947 04 36947 05	36947 03		37112 32	37112 32	37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 03	37132 03
36613 00	35732 50 36612 20	35732 00 pt 36612 00 pt	36949 07	36949 07	36949 09 pt	37112 33	37112 33	37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 05	37132 05	37132 06
36614 00	36612 40	36612 00 pt	36949 11	36949 11	36949 02		37112 33	37112 33	37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 06	37132 16
36631 00	36621 00 36629 41	36621 00 36629 00 pt	36949 12	36949 12	36949 03 36949 04	37112 33	37112 33	37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 07	37132 07	37132 07
36632 00	36622 00	36622 00	36949 13	36949 13	36949 05 36949 06		37112 33	37112 33	37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 08	37132 08
36691 00	36624 00	36624 00	36949 19	36949 19	36949 09 pt	37112 34	37112 34	37112 26 pt	37132 09	37132 09	37132 09
36692 00	36626 00	36626 00	36950 00	35732 20 36792 00	35732 00 pt 36792 00		37112 34	37112 34	37112 26 pt	37132 15	37132 15
36693 00	36628 00	36628 00	36991 00	36629 10 36629 45	36629 00 pt	37112 35	37112 35	37112 11 pt 37112 13 pt 37112 15 pt	37132 16	37132 16	37132 16
36714 00	36714 00	36711 00 36712 00	36992 00	36629 20	36629 00 pt		37112 35	37112 35	37112 11 pt 37112 13 pt 37112 15 pt	37132 17	37132 17
36715 00	36799 10	36799 00 pt	36995 00	36629 30	36629 00 pt	37112 36	37112 36	37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 18	37132 18	37132 18
36720 00	36797 00	36797 00	36997 00	35497 65 36629 47 36629 50	35497 65 36629 00 pt		37112 36	37112 36	37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 19	37132 19
36799 20	36799 20 36629 42	36629 00 pt 36799 00 pt	36998 01	36994 51	36994 51	37112 39	37112 39	37112 11 pt 37112 13 pt 37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 21	37132 21	37132 21
36799 30	36799 30	36799 00 pt	36998 02	36994 71	36994 71		37112 39	37112 39	37112 11 pt 37112 13 pt 37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 22	37132 22
36913 17	36913 17	36913 15 36913 16	36998 03	36994 72	36994 96 pt	37113 01	37113 01	37113 13 pt 37113 15 pt	37132 23	37132 23	37132 23
36914 25	36914 25	36914 21 36914 29	36998 04	36994 82	36994 82		37113 01	37113 01	37113 13 pt 37113 15 pt	37132 24	37132 24
36915 01	36915 01	36915 72 36915 75	36998 05	36994 83	36994 83	37113 02	37113 02	37113 13 pt 37113 15 pt	37132 25	37132 25	37132 25
36915 02	36915 02	36915 85	36998 07	36994 85	36994 85		37113 02	37113 02	37113 13 pt 37113 15 pt	37132 26	37132 26
36920 01	36920 01	36920 10 pt 36920 70 pt 36920 82 pt	36998 19	36994 97	36994 81 36994 96 pt	37113 03	37113 03	37113 13 pt 37113 15 pt	37132 27	37132 27	37132 27
36920 03	36920 03	36920 70 pt 36920 82 pt	37112 01	37112 01	37112 11 pt 37112 13 pt 37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt		37113 03	37113 03	37113 12 pt 37113 14 pt	37132 28	37132 28
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36920 05	36920 05	36920 10 pt 36920 70 pt	37112 02	37112 02	37112 23 pt 37112 25 pt		37113 04	37113 04	37113 12 pt 37113 14 pt	37132 30	37132 30

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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
3714A 01	3714A 01	37143 31	37322 21— Con.	37322 21— Con.	37322 40— Con. 37322 49	37433 03	37433 62	37433 62	38121 00	38111 00	38111 00
3714A 02	3714A 02	37143 21				37433 04	37433 69	37433 69	38122 00	36625 30	36625 00 pt 36629 44
3714A 03	3714A 03	37143 23	37322 23	37322 23	37322 47	37433 11	37433 71	37433 71	38210 10	38112 00	38112 00
3714A 04	3714A 04	37143 26	37322 25	37322 25	37322 48	37433 12	37433 12	37433 79	38210 20	38113 20	38113 00 pt
3714A 05	3714A 05	37143 49 pt	37322 27	37322 27	37322 55 pt	37433 13	37433 13		38244 00	38244 00	38244 11 38244 21 38244 31 38244 99
3714A 06			37322 28	37322 28		37433 14	37433 14				
3714A 07	3714A 07	37143 44	37322 29	37322 29	37322 53 37322 55 pt 37322 61	37511 01	37511 11	37511 11			
3714A 08	3714A 08	37143 49 pt				37511 02	37511 21	37511 21	38260 00	38326 00	38326 00
3714A 09	3714A 09	37143 46	37323 03	37323 03	37323 11 pt 37323 30	37511 03	37511 31	37511 31	38271 00	38324 00	38324 00
3714A 10	3714A 10	37143 47	37323 05	37323 05	37323 11 pt 37323 35	37511 04	37511 42	37511 42	38272 00	38325 30	38325 00
3714A 11	3714A 11	37143 48				37511 05	37511 44	37511 44	38273 00	38325 40	
3714A 12	3714A 12	37143 49 pt	37323 07	37323 07	37323 11 pt 37323 50	37511 06	37511 51	37511 51	38295 10	38293 00	38293 00
3714A 13						37511 09	37511 59	37511 59	38295 20	36625 20	36625 00 pt
3714A 19						37511 10	37511 10	37511 71	38296 00	38113 10	38113 00 pt
37151 00	37151 00	37151 10 37151 50	37323 13	37323 13	37323 11 pt 37323 56	37511 12	37511 12		38411 42	38411 42	38411 41 38411 45 38411 46
37152 01	37152 01	37152 00				37511 13	37511 13				
37152 02			37323 15	37323 15	37323 11 pt 37323 58	37511 14	37511 14				
37211 00	37211 00	37211 21 37211 23 37211 28				37511 15	37511 15				
			37323 17	37323 17	37323 11 pt 37323 70 37323 75	37512 01	37512 01	37512 14 37512 17	38411 85	38411 85	38411 82 38411 83
37244 01	37244 01	37244 13				37512 06	37512 06	37512 53	38411 87	38411 87	38411 84 pt
37244 02			37323 19	37323 19	37323 00 pt	37512 07					
37244 05	37244 05	37244 53				37612 01	37612 25	37612 25	38411 97	38411 97	38411 98 pt
37244 06	37244 06		37324 01	37324 01	37324 10 37324 15				38411 99	38411 99	38411 71 pt 38411 84 pt 38411 98 pt
37311 01	37311 01	37311 11 pt 37311 21				37612 02	37612 02	37612 35 37612 45	38421 01	38421 01	38421 99 pt
37311 02	37311 02	37311 11 pt 37311 31				37614 01	37614 13	37614 13	38421 02	38421 02	38421 35 pt
37311 03	37311 03	37311 11 pt 37311 41				37614 02	37614 02	37614 15 37614 17	38421 03	38421 03	38421 99 pt
37311 04	37311 04	37311 11 pt 37311 51				37615 01	37615 11	37615 11	38421 04	38421 04	38421 11 pt
37311 05	37311 05	37311 11 pt 37311 61				37615 02	37615 13	37615 13	38421 05	38421 41	38421 41
37311 06	37311 06	37311 81 pt				37615 03	37615 03	37615 15 37615 23	38421 06	38421 38	38421 38
37311 07	37311 75	37311 75	37324 09	37324 09	37324 18 pt 37324 20 pt 37324 25 pt	37922 61	37922 61	37922 59	38421 07	38421 71	38421 71
37311 09	37311 09	37311 11 pt 37311 81 pt				37922 63	37922 63		38421 08	38421 82	38421 82
37313 21	37313 21	37313 98 pt	37324 05	37324 05	37324 18 pt 37324 20 pt 37324 25 pt	37922 69	37922 69		38421 09	38421 81	38421 81
37313 29	37313 29	37313 10 37313 12 37313 14 37313 98 pt				37950 01	37950 01	37950 11 37950 15	38421 10	38421 45	38421 45
37316 01	37316 01	37316 13 37316 53	37324 07	37324 07	37324 18 pt 37324 20 pt 37324 25 pt	37996 01	37996 30	37996 30	38421 12	38421 12	38421 99 pt
37316 02	37316 02	37316 19 37316 59	37327 01	37327 01	37327 22 37327 25 pt 37327 32 37327 35 pt 37327 35 pt	37996 02	37996 32	37996 32	38421 13	38421 13	
37322 01	37322 01	37322 03 37322 04 37322 06 37322 08				37996 03	37996 34	37996 34	38421 37	38421 37	38421 33 38421 34
37322 02	37322 02	37322 11	37327 03	37327 03	37327 25 pt 37327 28 pt 37327 35 pt 37327 38 pt	37996 04	37996 36	37996 36	38421 91	38421 91	38421 99 pt
37322 05	37322 05	37322 19 pt 37322 07	37327 09	37327 09	37327 28 pt 37327 38 pt	37996 08	37996 08	37996 39	38421 97	38421 97	38421 15 38421 99 pt
37322 09	37322 09	37322 15				37999 01	37999 01	37994 92			
37322 11	37322 11	37322 19 pt	37327 11	37327 11	37327 41	37999 02	37999 02	37994 94	38421 98	38421 98	38421 11 pt 38421 35 pt 38421 99 pt
37322 19			37327 19	37327 19	37327 42 37327 49	37999 03	37999 03	37998 62			
37322 21	37322 21	37322 40 37322 42 37322 44	37328 00	37328 00	37328 11 37328 21	37999 04	37999 04	37998 64	38423 21	38423 21	38423 31
37322 09	37322 09	37322 15				37999 05	37999 05	37998 80	38423 22	38423 22	
37322 11	37322 11	37322 19 pt	37431 11	37431 72	37431 72	37999 06	37999 06	37998 53	38423 23	38423 23	
37322 13	37322 13	37322 17 37322 19 pt				37999 19	37999 19	37998 35 37998 51 37998 82 37998 84 37998 86 37998 90	38423 24	38423 24	
37322 21	37322 21	37322 40 37322 42 37322 44	37433 01	37433 41	37433 41	37999 21	37999 21	37998 88	38431 12	38431 12	38431 04
			37433 02	37433 61	37433 61				38431 13	38431 13	
						37999 21	37999 21	37998 88	38511 18	38511 18	38511 17
									38511 19	38511 19	
									38517 04	38517 04	38517 09
									38517 05	38517 05	

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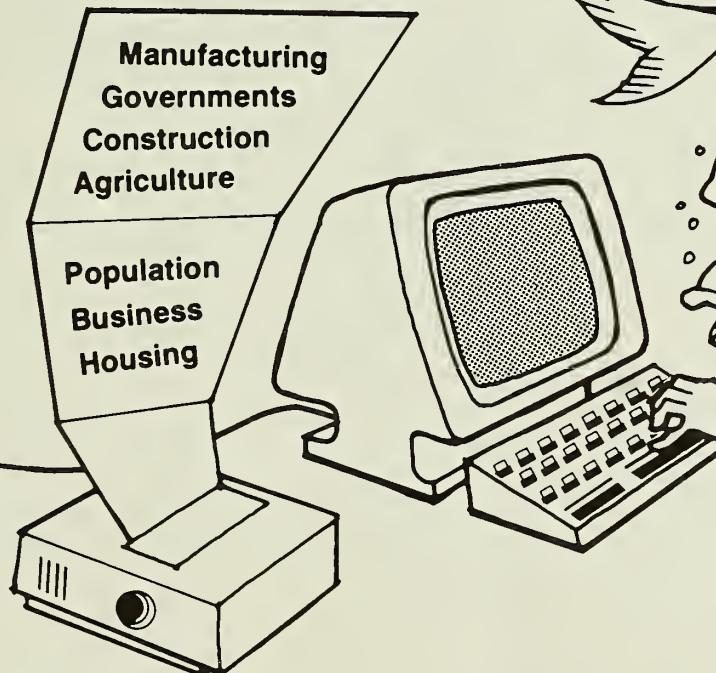
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38517 04— Con.	38517 04— Con.	38517 09— Con.	38731 06	38731 06	38737 01	39153 11	39153 11	39151 13 pt
38517 06	38517 06		38731 07	38731 07	38737 02 38737 03	39153 12	39153 12	39151 31 pt
38517 07	38517 07					39153 21	39153 21	39151 41
38517 10	38517 10					39153 31	39153 31	39151 51 pt
38517 11	38517 11		38731 11	38731 11	38737 19			
38611 11	38611 11	38611 12 38611 14	38731 13	38731 13	38736 39	39154 00	39154 11	39151 13 pt 39151 31 pt 39151 51 pt
38611 69	38611 69	38611 67 38611 68	38732 01	38732 01	38732 10 38732 22	39314 24 39314 25	39314 24 39314 25	39314 23
38611 91	38611 91	38611 81	38732 02	38732 02	38732 14 38732 24	39443 46	39443 46	39443 44 39443 45
38611 98	38611 98	38611 43 38611 99	38732 03	38732 03	38732 16 38732 26	39443 47 39443 98	39443 47 39443 98	39443 99
38613 17	38613 17	38613 27 38613 46	38732 09	38732 09	38732 18 38732 20 38732 29 38732 30	39447 16	36629 46	36629 00 pt
38613 89	38613 89	38613 98				39493 01	39493 01	39494 62
38613 97	38613 97	38613 61	39113 11	39113 11	39112 11 pt	39493 02	39493 02	39494 63
38615 01	38615 01	38615 11 38615 17 38615 32 38615 37	39113 21	39113 21	39112 21 pt	39495 05	39495 05	39495 99 pt
			39113 31	39113 31	39112 31 pt	39495 72	39495 72	39495 78 39495 79
38615 02	38615 02	38615 63	39113 41	39113 41	39112 41 pt	39495 81 39495 88 39495 89	39495 81 39495 88 39495 89	39495 99 pt
			39113 98	39113 98	39112 98 pt	39495 92	39495 92	39495 90 pt
38615 03	38615 03	38615 73 38615 74	39114 11	39114 11	39112 11 pt	39495 93	39495 93	39495 91 pt
38615 04	38615 04	38615 75	39114 21	39114 21	39112 21 pt	39495 96	39495 96	39495 90 pt 39495 91 pt
38615 05	38615 05	38615 57 38615 64 38615 65 38615 76 38615 81	39114 31	39114 31	39112 31 pt	39495 98	39495 98	39495 99 pt
38619 00	38619 00	38619 41 38619 43 38619 45	39114 41	39114 41	39112 41 pt	39496 01	39496 01	39494 65
						39496 02	39496 02	39494 68
38731 01	38731 01	38734 11 38734 12 38736 11	39114 51 39114 61 39114 71	39114 51 39114 61 39114 71	39112 98	39496 03 39496 04	39496 03 39496 04	39494 70
38731 02	38731 02	38734 22 pt 38736 13 pt	39141 41 39141 43 39141 69	39141 41 39141 43 39141 69	39141 66	39496 05	39496 05	39494 69
38731 03	38731 03	38734 21 38734 22 pt 38736 12 38736 13 pt	39142 41 39142 43	39142 41 39142 43	39142 61	39496 06	39496 06	39494 70 pt
38731 05	38731 05	38736 31 38736 32 38736 33	39142 45	39142 55	39142 54 39142 56	39523 00	39523 00	39521 00 39522 15
			39142 69	39142 69	39142 61 pt	39524 13	39524 13	39522 13
						39524 19	39524 19	39522 19
						39610 65	39610 65	39610 72
						39998 21	39620 21	39620 21

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330. *Phenyl-*o*-toluidine*

331. *Phenyl-*p*-toluidine*

332. *Phenyl-*m*-toluidine*

333. *Phenyl-*p,p'*-diaminobiphenyl*

334. *Phenyl-*p,p'*-diaminodiphenyl*

335. *Phenyl-*p,p'*-diaminodiphenylamine*

336. *Phenyl-*p,p'*-diaminodiphenylmethane*

337. *Phenyl-*p,p'*-diaminodiphenylmethane*

338. *Phenyl-*p,p'*-diaminodiphenylmethane*

339. *Phenyl-*p,p'*-diaminodiphenylmethane*

PUBLICATION PROGRAM

1987 CENSUS OF MANUFACTURES

Publications of the 1987 Census of Manufactures, containing preliminary and final data on manufacturing establishments in the United States, are described below. Publications order forms for the specific reports may be obtained from any Department of Commerce district office or from Data User Services Division, Customer Services (Publications), Bureau of the Census, Washington, DC 20233.

Preliminary Reports

Industry series—83 reports (MC87-I-20A(P) to -39D(P))

Preliminary industry data are issued in 83 separate reports covering 459 industries. Preliminary summary data for the U.S. and States are released in one report.

Final Reports

Industry series—83 reports (MC87-1-20A to -39D)

Each of the 83 reports provides information for a group of related industries ("dairy products" includes industries for butter, cheese, milk, etc.). Final figures for the United States are shown for each of the 459 manufacturing industries on quantity and value of products shipped and materials consumed, cost of fuels and electric energy, capital expenditures, assets, rents, inventories, employment, payroll, payroll supplements, hours worked, value added by manufacture, number of establishments, and number of companies. Comparative statistics for earlier years are provided where available.

For each industry, data on value of shipments, value added by manufacture, capital expenditures, employment, and payroll are shown by employment-size class of establishment, State, and degree of primary product specialization.

Geographic area series—51 reports (MC87-A-1 to -51)

A separate report is being published for each State and the District of Columbia. Each report presents data for industry groups and industries on value of shipments, cost of materials, value added by manufacture, employment, payroll, hours worked, new capital expenditures, and number of manufacturing establishments for the State, MSA's, counties, and selected places. Comparative statistics for earlier census years are shown for the State and large MSA's. Manufacturing totals are presented for each county and for places with significant manufacturing activity. Detailed statistics (including inventories, assets, rents, and energy costs) are presented only in statewide totals.

Subject series—7 reports (MC87-S-1 to -7)

Each of the seven reports contains detailed statistics for an individual subject, such as concentration ratios in manufacturing, type of organization, water use in manufacturing, textile machinery in place, distribution of sales by class of customer, manufacturers' shipments to the Federal Government, and a general national-level summary.

Reference series—1 report (MC87-R-1)

The Numerical List of Manufactured and Mineral Products includes a description of the principal products and services published in the 1987 Censuses of Manufactures and Mineral Industries.

Location of Manufacturing Plants—1 report (MC87-LM)

This report includes data for number of establishments by four-digit SIC industry and by employment-size class for counties, incorporated places of 2,500 inhabitants or more, and zip codes for each State. (This report is available only on magnetic tape and CD-ROM.)

Analytical Reports—3 reports (AR87-1 to -3)

Exports From Manufacturing Establishments (AR87-1)

This report presents data on exports by two- and three-digit SIC industry groups for the United States and States. Information is presented on value of direct report shipments and estimates of the employment required to manufacture these products. Included are estimates of employment in manufacturing and nonmanufacturing establishments that supply parts, materials, and services for production of manufactured exports.

Selected Characteristics of Manufacturing Establishments That Export (AR87-2)

This report presents data on the number of manufacturing companies and establishments that export by major group, State, employment size, and ratios of exports to shipments.

Indexes of Production (AR87-3)

The indexes presented in this report are designed to measure the change in physical output of each manufacturing and mineral industry between 1982 and 1987.

MICROFICHE

Every final published report in the 1987 Census of Manufactures will be available on microfiche.

PUBLIC-USE COMPUTER TAPES AND COMPACT DISCS

Data from the final industry series, geographic area series, and the Location of Manufacturing Plants report will be available on public-use computer tapes and compact discs-read only memory (CD-ROM). These tapes will provide the same information found in the final reports. Computerized data products are available for users who wish to summarize, rearrange, or process large amounts of data. These products, with corresponding technical documentation, are sold by Data User Services Division, Customer Services (Tapes), Bureau of the Census, Washington, DC 20233.

OTHER ECONOMIC CENSUSES REPORTS

Data on retail trade, wholesale trade, service industries, construction industries, mineral industries, transportation, enterprise statistics, minority-owned businesses, and women-owned businesses also are available from the 1987 Economic Censuses. A separate series of reports covers the censuses of outlying areas—Puerto Rico, Virgin Islands of the United States, Guam, and the Northern Mariana Islands. Separate announcements describing these reports are available free of charge from Data User Services Division, Customer Services (Publications), Bureau of the Census, Washington, DC 20233.





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